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THE USE OF MODERN INFORMATION TECHNOLOGIES FOR DEVELOPMENT OF THE COURSEWARE ON THE EXAMPLE OF THE TASK FROM THE COURSE «LOGISTICS»

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Now it has become actually touse information technologies in the training course for pupils and students. Lots of new methods are used and thought out for the organization of more convenient perception and effective understanding of material by pupils [1]. Properly worked out courseware will provide more convenient «dialogue» with the user, and also will allow to practice in any comfortable place. Using of the courseware helps to improve perception of information by students and that helps to reduce stress for the teacher and gives the possibility of remote training for the lesson (lecture, laboratory work) [2].

Keywords: logistics, Adobe Flash, courseware

Development of the courseware is carried out on the example of the topic «Placement of Regular Service Centre» in the course «Logistics». The courseware consists of three modules:

- 1) «theoretical material»;
- 2) «test»;
- 3) «training simulator».

In the «theoretical material» module lecture on the subject «placement of regular service centers» is represented for the students. This module consists of four blocks:

1. Introduction.
2. Necessary specifications.
3. Algorithm.
 - 3.1. Textual algorithm description.
 - 3.2. Formal algorithm description in the form of the flowchart.
4. Example solution.

All blocks provide the use of hyperlinks. That is made in order to help the student who doesn't know any definition or phrase, don't spend his time and just click on definition to follow the link to receive additional information.

In the «test» module the student is given the opportunity to check the learned material. The student has to answer questions on this topic. In this module questions of bothtypes, closed and opened, were used. Open questions assume a definite answer which the student has to enter by itself (Fig. 1). Closed questions are questions in which some variants of answers are provided to the student and he has to choose one or more, that are correct (Fig. 2).

Open questions allow the student to enter the answer in numeral or wordform. The closed question means oneor more correct answersfrom several variants.

In the «training simulator» module the student needs to analyse a matrix and to process data by Floyd-Uorshella algorithm for the purpose to find minimum value for optimum placement of regular service centers. The «training simulator» module will work in two modes: «Demo» and «Control». The «Demo» mode will allow the student to look on a con-

crete example as standard problems are solved. The «Control» mode will allow to reveal extent of understanding of the studied material in points.

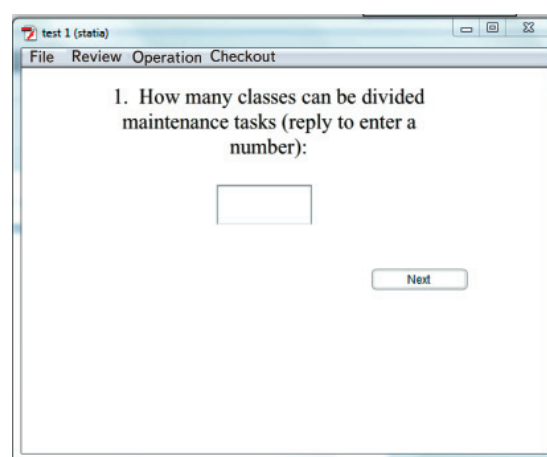


Fig. 1. Openquestion

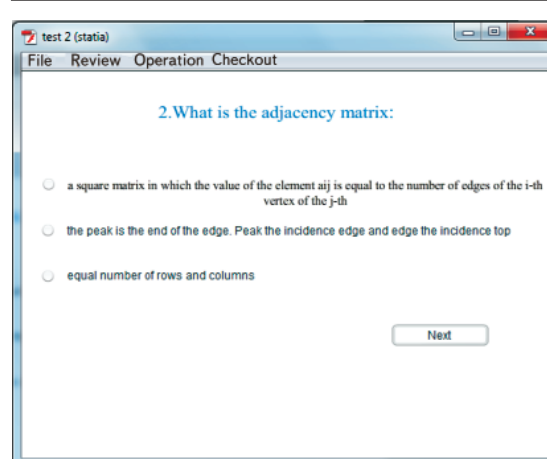


Fig. 2. The closed question with one variant of the answer

At an entrance to the «training simulator», the student is given the opportunity to choose

dimension of a matrix. After that the student gets on a slide, where the matrix with values depending on the chosen dimension is represented, with the «find» buttons (Fig. 3).

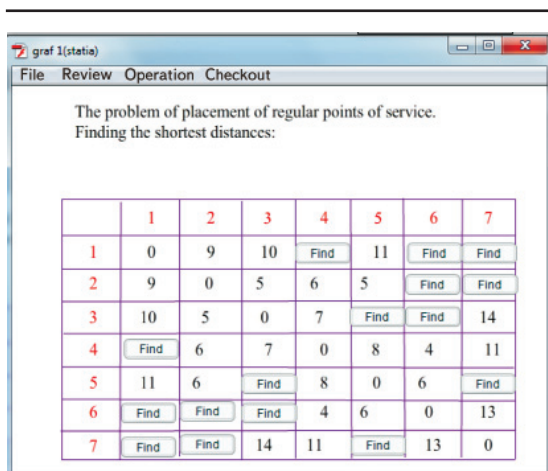


Fig. 3. Matrix of the Shortest Distances

By pressing the «find» button, the «training simulator» will show to the student how to find the shortest way from each top to another and to find among them the minimum value by searching all over possible ways by Floyd-Uorshalla algorithm. The minimum value will be marked out with green color (Fig. 4).

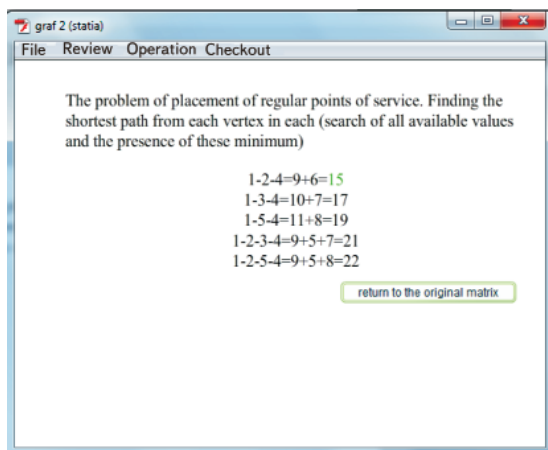


Fig. 4. Search of all available values of top. Finding of the minimum value

After that the student has to press the button «return to an initial matrix» and in the initial matrix value will be illuminated by green color.

The student has to find all values in the matrix and after that it becomes possible to receive a total matrix of the shortest distances. After finding of a total matrix of the shortest distances, the student is given the opportunity to look how the calculation of the sum of multiplications of ele-

ments of the corresponding line and column on a weight vector to find optimum point of placement of a regular service center (Fig. 5).

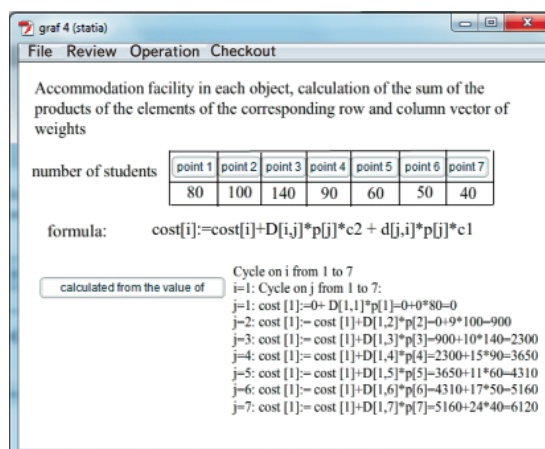


Fig. 5. Calculation of the sum of multiplications of elements of a line and column on a weight vector

The number of pupils is generated in a random manner, the student has to press by turns the buttons «point 1», «point 2», etc. Then the student has to press the button «calculate value on a formula» and nearby the result on point 1 will be output, then, in this case, he has to look at results at all 7 points.

After that the student gets on a slide in which when pressing the button «value in point 1» all answers of the previous slide (to Fig. 6) will be output.

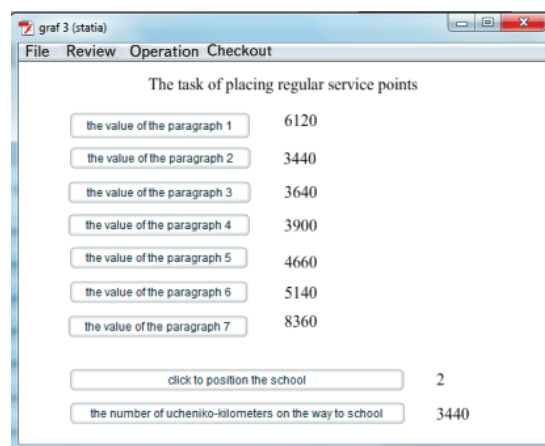


Fig. 6. Finding of point and number of ucheniko-kilometers where it is necessary to arrange school

By pressing the «point in which it is necessary to arrange school» button, he in this case,

will receive top 2, when pressing the «number of ucheniko-kilometers on the way to school» button value 3440 will be removed.

In the «control» mode the student should enter all values manually, there will be no prompts, at incorrect value introduction two times, The student won't be able to pass to the following stage of the solution of a task, if he has entered incorrect answer two times, in this case he should choose other task and to start solving it again.

The advantage of this practical work is casual generation of matrixes by the computer (on the set set of parameters) that allows to provide always to students various tasks in a look convenient for visual perception [3].

Development of the courseware is carried out in the programming environment Adobe Flash, allowing quickly and effectively to create highly – interactive appendices. The courseware has to help the teacher with examination of students and increase interest

of students in the course of material studying. This laboratory courseware will allow to bring teaching process to new level and to increase quality of training in the field of applied mathematics, information technologies and logistics [4].

References

1. Bushina K.S. Advantages and the main components trainingpraktikym, Scientific sessions of NIYaUMEPHI 2012 «Youth and Science». – URL: <http://mn.mephi.ru>.
2. Bushina K.S. Modern approaches to creation of a training practical work for distance learning, the Scientific SWorld conference: Modern problems and ways of their decision in science, transport, production and education. – 2012. – URL: <http://sworld.com.ua>.
3. Guseva A.I, Gavrilov S.I. Tikhomirova A.N. model of quality management of information and educational resources, Software products and systems. – 2010. – № 1. – P. 146–149.
4. Tikhomirova A.N., Solopay A.Y. Proyektirovaniye and realization of an electronic training workshop on a subject: Decision-making on the basis of a method of the analysis of hierarchy, Modern problems of science and education. – 2012. – № 3; URL: <http://www.science-education.ru/103-6363>.

PSYCHOLOGICAL SUPPORT OF JOURNALISTIC EDUCATION AS FACTOR OF FORMATION OF MASS MEDIA CULTURE

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Results of psychological support of training of students at the faculty of journalism, including research of characteristics of self-actualization, subjective wellbeing and their interrelations with life-sense and personal characteristics as indicators of culture of future specialists of Mass media, and also their distinctions at students with various levels of self-actualized are presented. It has been defined that indicators of subjective wellbeing negatively correlate with many self-actualized characteristics that leads to the assumption of interrelation of self-actualization with emotional discomfort in the course of professional training. Results of research of students of the first and fourth courses of faculty of journalism show that they don't have enough general intelligence and sensibleness of their life to feel subjective wellbeing. At the training final stage at the university the number of students with high and low level of self-actualization increases that adversely characterizes the process of self-actualized formation of students of faculty of journalism. In the process of self-actualized male students prove to be more inclined to cooperation, than female students. The bigger quantity of interrelations at students with low level of self-actualized shows dynamism and differentiation of the structure of their personality being in development.

Keywords: students of the journalism faculty, culture of mass media, self-actualization (SA), subjective wellbeing, life-sense orientations, reflexivity, personal qualities

Culture produces concrete rules and ways of communication adequate to conditions of the life activity of people. Journalistic activity is directed its attention to communicative, cognitive, informational and other functions of culture. The need for these functions follows from aspiration of any culture to create its own picture of the world. The process of cognition is characterized by reflection and reproduction of reality in the person's thinking. The informational function of the culture provides the process of cultural succession and it is shown in fixing the results of sociocultural activity, accumulation, storage and systematization of information. Modern society is characterized by two dominants – mass character and consumer character.

Mass media as means of mass information (communication) – press, radio, cinema, TV, audio- and video cassettes, computer technologies, the Internet and other electronic technical means – is technologies and institutions, through which information and other forms of symbolic communication extends centralized to at most broad segments of population.

In the process of information translation manipulation of consciousness of the mass consumer in interests of «producer» of this information occurs [1, 2]. Standardization of cultural texts (presentations, images, standards, technologies) is carried out. Any product of mass culture (whether it be work of art or advertising reel) is calculated on the average person, who is ready to make ready decisions and not to create his/her own ones. Mass culture gives the person simple answers to difficult questions. There is deindividuation, dehumanization as a result of which the person becomes not the purpose but means in a general mass of consumers of cultural texts for it being

made to him being given. To keep identity and uniqueness of consumers of mass culture journalists have to be authentic and self-actualized persons, capable to create congruent, coordinated information.

Journalistic education, besides development of competences of students has to pay a close attention to personal maturity of future specialists, sensibleness and intelligence of their life, competently planned career, the created personal and psychological culture which in their professional activity will be projected on mass consciousness [3, 4, 5]. In it considerable support is given by psychological maintenance of process of training at journalism faculty.

Development of the sense sphere, the reflexive relation to the behaviour and internal mental acts allows the person to realize in relation to life valuable-sense self-determination [3, 4, 5]. At psychology lessons with students of faculty of journalism at initial and finishing grade levels education at the university (the first and fourth courses, as a whole 127 people aged 16–21) besides educational tasks we carried out the program on self-cognition of students of themselves as future specialists: level of SA, formation of life-sense orientations, reflexivity, responsibility and control locus, necessary for them for realization of educational and ideological functions of journalistic activity. In completion of training students wrote the essay on the results of the executed tests and tasks on the subject «Influence of Psychological Knowledge on Development of My Personality» or «Influence of Psychological Knowledge on Development of My Professional Abilities».

In 2006 the author of this article for the first time carried out studying of features of SA of

students of economic and technical specialties of South Ural State University and it was established that need of SA was more peculiar for students of economic specialties than for students of technical specialties and need of SA is stronger expressed at female students than at male ones [5]. On the basis of this research the conclusion was drawn that, first, features of SA are connected with professional training and specifics of training and, secondly, that educational process (first of all, the humanitarian component of education) has positive impact on SA development, especially at students of nontechnical specialties. According to 2006 year research humanitarian and economic specialties of education attracted socially mature graduates of schools with actual life characteristics while entrants with a low level of development of SA chose technical specialties as the more concrete and exact.

The purpose of the research was:

a) to define dynamics of personal development and subjective wellbeing of students in the course of their training at journalism faculty;

b) to define interrelations of indicators of subjective wellbeing with SA and personal qualities at students of the first and fourth courses of faculty of journalism;

c) to reveal distinctions between indicators of the studied characteristics at students of the first and fourth courses.

After carrying out the cluster analysis (on the scale A of test SAT, more and less of 50 points) and after the correlation analysis by means of Spirmen and Pearson's criterion on definition of interrelations the following results were received.

Selection of first-year students was divided into 3 sub selections: students with high level of SA – 27,9 per cent of initial selection, with medium level of SA – 37,7 per cent and with low level of SA – 34,43 per cent. It has been revealed 7 negative on a sign of interrelations of an indicator of a scale of subjective wellbeing ($M = 4$) with research variables (from all set of 26 variables), namely: with an indicator of internal support B-SAT ($r = -0,382, p \leq 0,05$); valuable orientations C-SAT ($r = -0,418, p \leq 0,05$); acceptance of yourself H-SAT ($r = -0,369, p \leq 0,05$); openness to experience PQP-O (Personal Questionnaire of the Professional) ($r = -0,713, p \leq 0,01$); process of life according to SZhO ($r = -0,483, p \leq 0,05$); locus kontrolya-Ya according to SZhO ($r = -0,495, p \leq 0,01$) and general intelligence of life according to SZhO ($r = -0,446, p \leq 0,05$). The described results allow drawing a conclusion that first-year students of faculty of journalism are characterized generally by low and moderate expressiveness of indicators of subjective wellbeing, serious problems are absent at

them, but also there is no emotional comfort. They don't consider that they are responsible for their own emotional wellbeing which, in their opinion, isn't connected neither with universal values (with valuable orientations of self-actualized people), nor with acceptance of the merits and demerits out of estimates of people around, nor with openness to new ideas and values, aspiration to improve something in the work, search of new variants of performance of work, nor with ability to enjoy life and live it emotionally rich. The surveyed first-year students don't consider themselves as the strong personalities, capable to create for themselves emotional wellbeing and to include it in the sense of their life.

By results of inspection by a technique of SAT the selection of students of the fourth course was divided into 3 sub selections: students with high level of SA – 36,1 per cent of initial selection, with medium level of SA – 27,7 per cent and with low level of SA – 36,13 per cent. 4 significant interrelations of an indicator of a scale of subjective wellbeing ($M = 4,22$) with other variables of research are allocated: with results on scales of sociability L-SAT ($r = +0,468, p \leq 0,05$); conscientiousness PQP-C ($r = -0,445, p \leq 0,05$); purposes in life according to SZhO ($r = -0,635, p \leq 0,01$) and locus kontrolya-Ya according to SZhO ($r = -0,504, p \leq 0,05$).

The described results testify that for students of the fourth course of faculty of journalism an emotional component of subjective wellbeing (level and qualitative characteristics of which are almost the same as of first-year students) is connected with ability deeply to understand other people deeply and not to be mistaken in definition of motives of their behaviour (that for journalists can be considered as professionally significant quality). However students of the fourth year have no feeling of subjective wellbeing in need of manifestation of the conscientious and responsible attitude to work, control over the impulsive behaviour. Comprehension of the purposes for the future causes emotional discomfort in them, they as well as first-year students, don't consider themselves as strong personalities in respect of «arrangement» of their subjective wellbeing and happiness.

Determination of distinctions between indicators of psychodiagnostic techniques of the surveyed students of the first and fourth courses was carried out by means of Mann-Whitney's criterion and the one-factorial dispersive analysis of ANOVA and showed that there were no significant distinctions between expressiveness of indicators on the scale of subjective wellbeing and life-sense orientations. At the same time, distinctions in their SA and personal

characteristics have been revealed. Students of the first and fourth courses significantly differ on indicators of flexibility of behaviour and sensitivity to themselves, and flexibility of behaviour is inherent more in students of the fourth year, and sensitivity to themselves – in first-year students (by results of ANOVA at $p \leq 0,05$). Flexibility of behaviour characterizes students at the final stage of their training at the university as capable to show in real life the values inherent in self-actualized people. Sensitivity to their needs and feelings remains a prerogative of first-year students. In respect of training prospects at the university it is necessary to consider that professional education has to put one of the tasks preservation of their sensitivity to their needs, but also development of other SA qualities. Distinctions in expressiveness of personal characteristics at students of the first and fourth courses are revealed on three scales: extraversion PQP-E ($p \leq 0,05$), openness to new experience PQP-O ($p \leq 0,01$) and conscientiousness PQP-C ($p \leq 0,05$). First-year students are more than their senior companions, sociable, forceful and active, open for new experience in respect of professional training and are more conscientious. At first-year students in the selections created on a sexual sign (the number of selection of male students is 4,25 times less than the number of selection of female students), gender distinctions in expressiveness of arithmetic-mean indicators on scales of cooperation PQP-Coop.

($M_{\text{male}} = 3,58$; $M_{\text{female}} = 1,24$ at $p \leq 0,01$) were also revealed. Young men wish to cooperate with other people more than girls who are more ready to rivalry and competition.

Psychological support of journalistic education was the factor of formation of psychological and social culture of future journalists, it allowed to reveal actual problems of formation of the personality of future specialists of Mass media in due time and to correct development of their life-sense orientations, process of SA and subjective wellbeing. Psychological support was given in the development of personal and social maturity of future workers of Mass media, the purpose of whose professional activity will be influence on outlook and culture of the population.

References

1. Berezkina O.P. Social and psychological influence of mass media: manual for students of universities. – M.: Publishing centre «Academia», 2009. – 240 p.
2. Ilyin A.N. Subject in mass culture of the modern society of consumption (on the material of kitch-culture): monograph. – Omsk: «Amfora», 2010. – 376 p.
3. Lazarak O.V. The historiography of the problem of the humanitarian orientation of the personality // Modern High School: innovative aspect. – Chelyabinsk: Publishing house of RBIM, 2013. – № 1. – P. 85–90.
4. Shchelokova E.G. Features of career orientations of university students. Vestnik of University (State University of Management). – M.: SUM, 2011. – № 22. – P. 86–87.
5. Yashchenko E.F. Valuable-sense concept of self-actualization: the thesis of the Doctor of Psychology // YarSU. – 2006. – 454 p.

*Materials of Conferences***ACADEMIC MOBILITY AND THE PROBLEM OF EDUCATIONAL PROGRAMS' CONTINUITY**

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Processes of globalization and internationalization of higher education play an important part in modern social-economic context of developing educational systems. Academic mobility is a useful tool of integrating Russia into international educational and scientific space.

According to the definition by European Council, academic mobility is training, teaching, carrying out researches abroad, and after it a tutor or a researcher returns to his basic educational institution [8]. Besides, analysis of the recent documents of European space of higher education allows us outline institutional mobility and mobility of programmes and people [9].

In 2013 National fund of Staff Training presented the results of systematizing and evaluating mechanisms of collaboration between Russia and foreign countries in order to develop academic mobility: regulative basis, tools, and practices [6].

The analysis of international agreements shows that distribution of bilateral agreements is majorly represented by agreements on acknowledging graduation documents, scientific-technical collaboration, and also collaboration in field of science, culture, education, and sports [1].

The greatest number of bilateral agreements refers to countries of European Union, CIS, and Africa. Basic platforms of Russian international collaboration on science and education are the following organizations and unions: EU, Council of CIS state leaders, Antarctic Council, Council of Baltic states, Shanghai Cooperation Organization, Council of The Barents-Euro Arctic Region, EurAsEC, BRICS, ASEAN, APEC, BSEC.

Majority of the agreements is directed towards realization of physical exchange of scientists, researchers, students, aspirants, and tutors. Besides, modern priorities of developing academic mobility are not reflected sufficiently in the corresponding national documents and international agreements. Most international agreements have been concluded before 1999 (moreover, 30% of them – before 1992), and this fact does not imply solution of urgent problems.

Only 6% of them implement joint programmes and projects in the area of education, science, culture. Only 6,2% of international pacts are directed towards carrying out combined researches and training staff in prior sectors of economy. The least number of agreements implies scientific-technical

collaboration in the area of processing natural resources, oil-and-gas industry, electronics and machine building, textile and light industry, aerospace technologies.

According to researches, «leak of minds» is present in all sectors, but most of all is affects prior directions of industry (space technologies, applied and theoretic physics, chemical technologies, biochemistry, microbiology, genetics, mathematics, and programming) [4]. Branch strategies and programmes aren't completely directed towards integration into international research and educational space, not all of them cover problems, prior regions, and applied areas of international collaboration [3, 6].

We should outline that Russia plays the part of «state partner» in most programmes, and it does not allow our country to lobby our national interests, select prior research directions, and adjust target indexes.

Russian programmes of education development are mostly directed towards proving for incoming students' mobility, and also outgoing mobility of tutors, students, and aspirants. Organizing educational camps at the foundation of higher educational institutions is an example of realizing these principles [2]. In this case, educational system becomes a key institute of social-cultural adaptation, decrease in risks of social safety of a whole region.

As the Center of sociological researches by the Ministry of education and science of RF shows, the number of international students of both full- and part-time education forms increases in Russian institutions every year [3]. Changes in specialization choice have happened, though interest towards studying engineering-technical, medical, and human-social subjects has remained.

Russian state grants for foreign students are majorly issued for countries of CIS, Asia, Africa, and Close East, and less frequently – for countries of Latin America, Eastern-European and Balkan countries, countries of Western Europe and Baltics, and also states of Northern Europe. Academic exchanges and joint scientific researches are especially necessary with countries that lead in innovation areas: EU, the USA and Canada, Japan, Korean Republic.

We should outline that within exchange programmes that are carries out during summer and winter vacations, participants can not only solve problems that lay within their educational trajectory (studying a language, forming and developing professional skills), but also obtain skills of international communication.

A program of an educational camp includes training and immersion into a cultural environment in order to assist adaptation, it provides for a complete and quick overcoming of negative consequences of «cultural shock», passing identity crisis.

Facilitating a potential of educational environment of an institution allows one to introduce methodology of cross-cultural orientation and integration in terms of foreign culture (cultural assimilators, trainings, educational programmes of intercultural education), thus forming an atmosphere of tolerance within an institution, overcoming xenophobia and alienation, increasing intercultural competence of all participants of educational process.

Enriching of behavior repertory of participants takes place while mastering an educational camp programme, it allows them to interact with residents efficiently. It implies means of overcoming stress, self-regulation, and improving one's functional condition; developing communicative skills in order to overcome language gap and master verbal and nonverbal ways of behavior; realizing differences of cultural dimensions in order to improve comprehension between cultures [5]. A single perspective of participant's way of life is an important measure of integrating into a society, training for professional activity in a foreign environment [7].

At the same time, not only foreign guests need to adapt to educational environment and features of hosting side, but local students and tutors also need to adapt to presence of foreigners.

The problem of programme succession, acknowledging graduation documents becomes acute between domestic and foreign institutions. Coordinating programmes of carrying out summer camps can lead to introducing obtained competences into the training process (for example, taking language practice in Russian).

A similar practice is being successfully implemented in Artem branch of Federal state budget organization of higher professional education «Vladivostok state university of economy and service» as a part of the signed agreements on collaboration with Yanbian state university (Yanji, China) and International School of Business «Sol Bridge» (Woosong University, Daejeon, South Korea). The institutions exchange students while realizing the programme of educational camp during summer and winter vacation. Nowadays a work on creating cultural centers at the foundation of education environment of institutions is carried out.

While passing probations, students not only study foreign languages in audiences, but also experience culture of nations via immersing into a different cultural environment (theatres, folklore, chorus singing, excursions). An early project and review concert are presented in the end, thus students demonstrate what they have mastered during their visit to a foreign country.

All in all, academic mobility provides for the development of human potential and highly-technological sectors, increase in global competitiveness of basic branches of industry, forming a positive image of Russia, popularization of Russian language and culture, and also protection of rights and interests of Russian citizens and their compatriots who live abroad, consolidation of Russian diaspora [2].

Russia follows basic trends of developing internationalization of higher education and academic mobility: internal regulations of Russian Federation outlines such priorities as increase in academic mobility, fortifying relations with foreign educational and scientific organizations, broadening initiatives on developing network partnerships between different Russian and foreign organizations, active usage of distant and continuous forms of education. However, Russia falls behind the developed countries according to a number of indexes, and it points out the necessity to activate academic mobility.

It is necessary to refresh the basis of international agreements, direct them towards collaboration in those sectors of industry that are prior in Russia [3, 6], improve the existing and create new tools of academic mobility, intercultural communication.

Apart from forming normative field, mechanisms and tools of realizing academic mobility, it is no less important to create regulative, infrastructural, social-economic, and other conditions of developing international collaboration in the area of education and science, attracting foreign students and scientists to study and work in Russian institutions and scientific organizations.

References

1. Bubnovskaya O.V. Academic mobility as an integration tool of Russia into the international educational and scientific space // «International Journal of Applied and Fundamental Research» (Materials of the conference «Education and science without borders», November 17–22, 2013). – 2013. – № 2. – URL: www.science-sd.com/455-24398 (20.11.2013).
2. Bubnovskaya O.V. Educational camp as a form of incoming and outgoing mobility // Education: traditions and innovations: Materials of the III international scientific conference (October 21, 2013). – M.Ed. N.V. Uvarina – Prague, Czech Republic: Publishing House «World PRESS» s.r.o., 2013. – P. 67–70.
3. Foreign students in Russian universities // Proceedings of the meeting-seminar of Russian universities' rectors and vice-rectors in international activities (Moscow, December 5, 2012).
4. Ryazancev S.V., Pismennaya E.E. Emigration of scientists from Russia: «circulation» or «brain» drain // SOCIS. – 2013. – № 4 (336). – P. 27.
5. Soldatova G.U. Training of increasing intercultural competence / G.U. Soldatova, L.A. Shaygerova, A.V. Makarchuk. – M.: Lomonosov Moscow State University, 2005.
6. The results of the systematization and evaluation of mechanisms of Russian cooperation with foreign countries in order to develop academic mobility: the legal framework, tools and practices. – M.: National Fund of Personal Training, 2013.
7. Yermolayeva M.V., Shorkina N.A. The possibilities of psychological and pedagogical support of student-migrants' identity // Actual problems of psychological knowledge. Theoretical and practical problems of psychology. – M.: Scientific and practical journal. – 2012. – № 2 (23). – P. 45–55.
8. <http://archive.ehea.info/search>.
9. <http://www.coe.int/t/dg4/highereducation/resources/mobility.pdf>

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DEVELOPMENT OF INTEGRATION PROCESSES OF IMPLEMENTATION EDUCATIONAL MODELS IN UNIVERSITIES IN RUSSIA AND EUROPE

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We have done the analysis of the existing education system in Germany from the school (Abitur) to the University. The modern higher education in the form of three types of higher education institutions: universities, universities of applied science, higher art schools and conservatories. The scheme of options for obtaining a master's degree as a core organizational structure of the national education system in Germany. Discloses the content of the preparation of masters on the example of the organization of the educational process at the Faculty of Engineering and Shipbuilding Engineering, University of Rostock. This work was supported by the Ministry of Education and Science of Russia in the framework of the federal target program (Measure 1.5 of 17.09.2012 № 14.V37.21.1247).

1998 amendments to the Law on Higher Education in Germany gave universities the right to introduce new Bachelor's and Master's degrees. So since 2008 classical engineering education disappeared at the University of Rostock. One should study for a period of 6 to 8 semesters to receive the Bachelor Degree, for MA – 2 to 4 semesters. In the case both courses are sequential stages of a longer training program, their total duration shouldn't exceed 10 semesters. New courses may substitute traditional ones or go in parallel with them, but additional state funds are not allocated to it [1]. The main feature of training in Germany – the formation of the educational process is fully regulated by local laws of their Land, or area. There is no direct reporting to the Federal Education Institutes or the Ministry of Education. To enroll for the Bachelor degree one should provide school graduation certificate (abitury) and evidence of eight week long practical work in the company with the relevant profile. This allows the student not only to obtain an idea of the future profession, but also to master the first practical skills. If the applicant has completed secondary professional education he is waived of the practical work requirement. High school and some professional schools can issue abitury. Such schools train only the strong and talented students in the selected field. Modern higher education in Germany is represented by three types of higher education institutions, such as:

1. Universities that offer the full range of academic disciplines. Traditionally, it concerns the fundamental theoretical education, especially directed and focused on theoretical research.

2. Universities of Applied Sciences focused on engineering sciences and education in technical and economic areas, training social workers and designers. These universities are engaged in applied research and experimental development, with a clear practical stance. Education is professionally-oriented, education is harmonized and integrated with specific industrial enterprises and other specialized institutions.

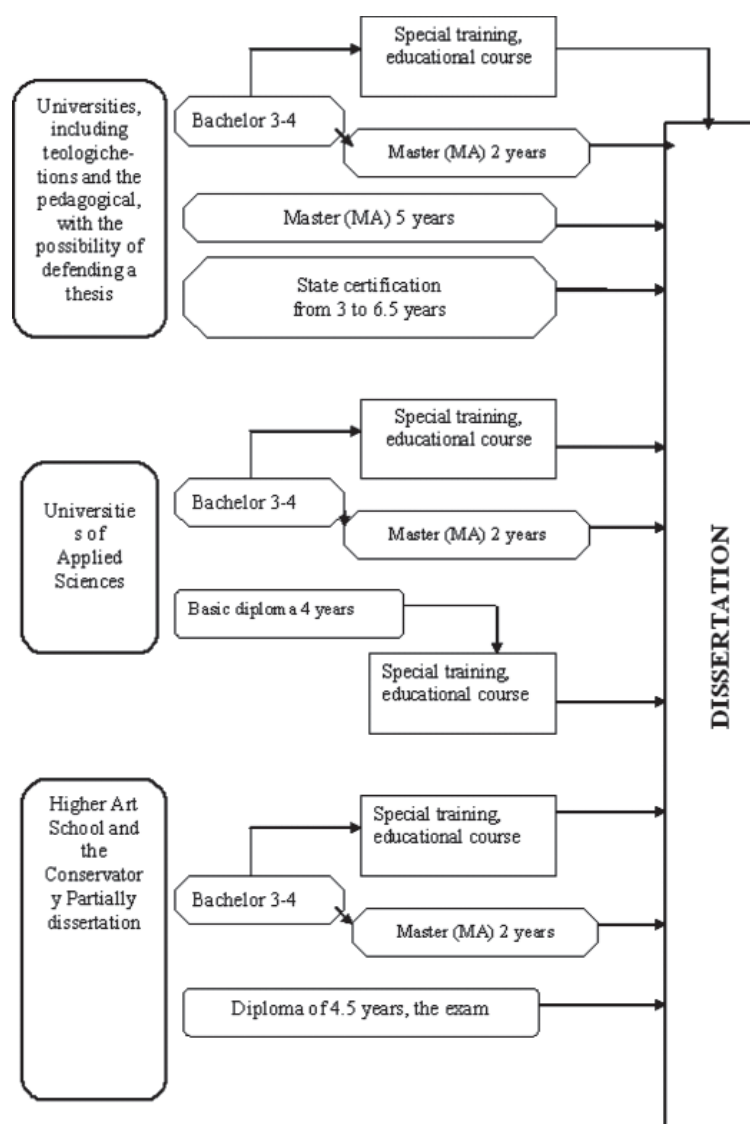
3. Higher art schools and conservatories, which in their turn offer training programs for artistic activities in the visual arts, theater and music, in directing, production and screenwriter training for the theater, cinema and media, film and media technologies, especially in design, architecture and communication.

In all the three types of higher education training programs are designed so that the disciplines existing independently were gradually integrated into a logical sequence of step-by-step progress to the graduation essay that is subject to state inspection and certification, acting within the framework of the Bologna process since 1998. The first four semesters of bachelor are intended to study humanitarian and natural sciences and general professional disciplines. The next two semesters focus on the disciplines that address the practical professional problems. Education is divided into modules. Typically, modules are a group of subjects, similar in content taught in a close period of time. One module usually takes more than one semester. Each module ends with an examination. In each semester the student must score 30 points (credits ECTS [2]). Points are given only if the course is fully completed, satisfies to all requirements and examinations are passed successfully. And fairly lengthy series of lectures, workshops, intermediate coursework and exam allows a total score of 6 points. Total labor student per semester is 900 hours, including lectures, practice, and independent work. Selfstudying disciplines course given special attention. To be eligible for the exam, the student attendance at the lectures of the course is optional. It is mandatory that the presence of credited coursework assignments. Starting with the fifth semester of undergraduate programs of development, practice design work on aspects of the industry. The main idea is to teach people how to work in teams and to manage them. Students together in creative teams consisting of two or three or more people. The team selects a topic from a list proposed by the department. The group leader is chosen – the director of a small business – a self-regulatory body.

For example, at the Faculty of Mechanical Engineering and Shipbuilding Engineering, University of Rostock is one of those developed in the spring semester of the project was formulated as «sustainable development winged». The nature of the anticipated massive experimental research in the wind tunnel study of aerodynamics on a computer using existing programs, geometric modeling using Autocad, Catia, ProEngineer, etc.

The second important aspect of the project – its multidisciplinary. Completion of the project involves public defense. In the fifth semester on the job training is the production (industrial) practice complexity equal to the six-point credit. The University is not engaged in the search for an internship companies. It is the task of the student. In the sixth semester student training schedule consists mainly of three lectures and parallel preparation of the final qualifying undergraduate work. Mas-

ter study programs (master) are more focused on a variety of applications and differentiated research. On the ma-level sterskom the University are encouraged to study in a semester in a foreign university or specialized enterprises abroad. In most cases, mainly due to removal of language barriers, selectable near Scandinavian countries (excluding Finland), at least in France, Italy, USA. The decision on the recognition of test data from abroad, take the examination board of the faculty.



The core of the organizational structure the national education system in Germany

Each curriculum masters institutions rigidly fixed to a specific profile. Written graduation work, 900 hours of labor input, is included in the curriculum of the wizard. Educational programs of the second category (master) end with the possible assignment of the following degrees: Master of Arts, Master of Science,

Master of Engineering, Master of Law, Master of Music. On the basis of curricula wizards that the content is not a direct continuation of the undergraduate curriculum, may be produced such levels of training, such as, MBA (Master of Business Administration) (see Figure). A distinctive feature of the educational system in

Germany is to have an integrated «one-step» training monoprogramm that exist for either one or two major areas of undergraduate, or for one main and two additional areas of the Judiciary. Such a program can be called, educational platform, which lasts from 1,5 to 2 years and promotes deep orientation and the acquisition of fundamental knowledge.

The result at the end of training is to provide a written final work (deadline to 6 months) and interdisciplinary written and oral exams. Acquired qualification matches master (Master). The average period of study at the universities of integrated training programs for 5 to 6,5 years (master's degree).

Obtained according to the traditions of the institution: legal, medical, pharmaceutical and teaching, confirmed the state inspection certificates to master academic skills are equal and form a formal prerequisite to obtaining a doctorate. In this case, when it comes to specialized higher education institutions (higher education), the average period of training in them is on integrated curriculum 4 years with a diploma of higher education, but the holders of such certificates of special higher education institutions do not have the right to receive a doctorate. These graduates are eligible for admission to the doctoral candidate's degree in eligible institutions of higher education, passing on additional educational training (including the master) university program. In education in the higher art schools and conservatories, depending on the relevant specialty and individual target setting, along with a master's degree, if any certified integrated curriculum, based on the final examinations for special and professional goals may be issued certificate. Continuity of student transition from the previous level of education diploma to follow often require entrance exams, and is determined necessarily corresponding minimum required size and content of the previously studied educational courses that form the core skills first class required to go in the second. This work was supported by the Ministry of Education and Science of Russia in the framework of the federal target program (Measure 1.5 of 17.09.2012 № 14.V 37.21.1247).

References

1. Gayazova, EB Comparative analysis of the two-level organization of the preparation in the system of higher education [text]: The reporting Materials Scientific Conference KSTU «Current state of higher education in Russia: the scientific and methodological Collateral», 23 November – 18 December 2009 (Russia, Kazan), available at: www.kstu.ru.
2. European Credit Transfer Systems (ECTS) [electronic resource]: Web-master-Copyright, available at: www.ects.muh.ru/content/index.htm.
3. According to the official press materials, available at: www.fh-bonn-rhein-sieg.de/fhbrsmedia/Downloads/international/NatStatem_GER.pdf.

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PREPARATION TEACHERS TO DEVELOPMENT OF STUDENTS INTELLIGENT ABILITY BASED ON ICT

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It is necessary to upgrade the existing forms, methods and didactic principles of organizing training process in an institution and develop new ones in order to establish an efficient preparation of students of pedagogic institutions for developing intellectual abilities of school students via means of ICT. If a system of continuous computer-directed preparation of students for their work on developing intellectual abilities of school students that will include a concept, a model, didactic conditions, technologies of gradual preparation of students for this activity is introduced, it will increase the quality of future teachers' professional preparation, as it will provide for formation of intellectual skills among them, and they are a didactic basis of the developing intellectual abilities among school children via means of ICT.

Education reform that has been introduced to Republic Kazakhsatn during the previous decade, has revealed a number of problems in its organization, defined a necessity to train an intellectually-developed person who is able to think actively, independently solve problems that arise before him, and urges for a constant deepening and broadening of his knowledge. At the same time, outdated methodology and principles of selecting education contents are negative factors of the existing secondary school system. Informational overload leads to a decrease in motivation for training and degradation of students' health. Training is directed towards receiving formal results, but not towards development of a person [1]. Desintegration of the single system of school education, emergence of various alternative training programmes and institution types has not solved all problems of this area.

According to the law «On education» and State programme of education development in Republic Kazakhstan during the period 2011–2020, one of the prior directions is transiting towards a new national model of training and upbringing scholars, and it requires new approaches towards educational activity of pedagogues [2, 3]. Studying the problem of achieving positive results in activity of teachers and school students has shown that one of the success elements in activity of subjects of pedagogic process is implementing new pedagogic technologies, informational technologies, interactive training.

Results of questionings and interviews, carried out with graduates of pedagogic institutions and school teachers have shown that most of them (92 %) don't know the essence and structure of intellectual abilities, have few ideas on how one can develop them, suffer significant complications of methodical nature. The reason of the described situation is

an insufficient training of teachers for this type of activity within an institution. Due to the described conditions, the problem of preparing future teachers for work on developing intellectual abilities of scholars has obtained a special urgency. There are studies on psychology and pedagogy that devote to problems of developing personality of students and developing training. Thus, M.A. Kostyuk outlines: «In fact, there is only one way of influencing psychic development of students: it lies in its activity, directed by a pedagogue. Actions that are not included into this activity, leave no traces, are not apprehended by him, and have no impact on his development» [4]. E.G. Budrina suggests concentrating our attention to special features of dynamics of student's intellectual development in terms of different educational models: corrective, traditional, and enriching [5]. Theoretic foundations of solving the problem of developing intellectual skills are widely presented in a whole number of psychic-pedagogic researches. Thus, G.N. Shornikova proves that a method and style of intellectual work are necessary means of forming generalized intellectual skills that allow one to use knowledge in different situations [6]. E.L. Kabanova-Meller, N.A. Menchinskaya, N.F. Talyzina, and other researchers have established a direct dependence between the method of mastering knowledge and successfulness of their practical implementation, they have also shown that an efficiency of mastering knowledge by students depends on their level of unifying analysis, synthesis, abstraction, and generalization skill. Training a secondary school teacher occupies a special place in the whole totality of factors that define improvements in the system of continuous education in the country. A number of directions have emerged within the totality of researches on problems of training future school teachers. One of them is characterized by development of professionogram and qualification characteristics in which contents and the system of teacher's theoretical knowledge is defined as well as his pedagogic abilities and skills that are necessary for carrying out his training-educational functions. This direction is represented by I.L. Ivanova, R.L. Mittelman, V.A. Slastenin, A.L. Sherbakov, and others. Problems of general training of secondary school teachers are studied in works by L.L. Egorova, Y.L. Kulyutin, Y.L. Sukhobskaya, and others. The problem of forming personality during the process of professional training is investigated by S.L. Baranov, V.A. Slastenin, S.D. Smirnov, and others. A number of studies is devoted to didactic preparation of a teacher (O.A. Abdullina, S.L. Arkhangelskiy, V.L. Zagvyazinskiy, and others). These works reveal ways, means, and forms of education that provide for the formation of a future pedagogue's professionalism.

In order to study the problem of professional training of future teachers for their work on developing intellectual abilities of scholars results, received by M.A. Romanova should be investigated [7]. The

scientist reveals contents of training students of pedagogic departments for their work on developing intellectual skills among primary school students within the process of mastering subjects of psychology-pedagogic circle, specific methods, variable special disciplines and pedagogic practices.

Modern period of social development is defined by a strong influence of computer technologies that penetrate all areas of human activity and provide for the distribution of informational flows within the society, thus forming global informational space. First of all, it affects education, so many dissertational researches of recent years are devoted to problems of preparing teachers for using informational-communicative technologies (ICT) in professional activity. Doctor dissertation by a well-known mathematician-methodist T. Balykbayev [8] studies theoretical- methodological basics of informational model of forming a group of students. Candidate dissertation of B.K. Tulbasova [9] is devoted to scientific foundation of didactic conditions in preparing teachers for activity with implementation of ICT within the system of refresher training. The work of G.G. Begarisheva [10] defines and explains the process of training and refreshing skills of teachers for using informational-communicative technologies in their professional activity within the system of methodical school work unification. Dissertation study by R.O. Djeranova [11] refers to scientific-theoretical grounding of didactic terms of forming computer-training skills of a future teacher. The work by N.A. Adilova investigates the problem of using innovative technologies of training in developing intellectual culture of students [12].

Thus, a great number of researches is devoted to problems of intellectual development of students, problems of professional training of future teachers for developing intellectual abilities of school students, problems of preparing teachers to use ICT within the process of secondary school education. However, analysis of the existing institutional plans and programme and our own studies show that training future teachers for work on developing intellectual abilities among school students via means of ICT remains unsatisfactory. A detailed study of this problem has allowed us to see that special researches, devoted to special features of work with students in terms of their preparation for solving problems of school children intellectual development via means of ICT, are almost non-existent.

Thus, we witness a conflict between needs of modern school where a teacher must consider special features of developing intellectual abilities of students and the necessity to prepare students for intellectual development of school students via means of ICT and insufficient presence of these problems in activity of an institution, programmes, textbooks and guides on psychological-pedagogic disciplines, and methods of teaching special disciplines in a pedagogic institution, lack of recommendations and the very methodic of preparing students

for developing intellectual abilities, and, therefore, students' disability to solve these problems. The outlined conflict that has been established between social demands and the level of teachers' readiness for meeting them has determined the selection of the research topic: «PREPARATION TEACHERS TO DEVELOPMENT OF STUDENTS INTEL-LIGENT ABILITY BASED ON ICT», it has also defined its urgency.

Realization of this research implies develop-ment of a **new conceptual approach** towards solv-ing the problem of professional training at the stage of institution education will create new directions of professional training of pedagogic institution students that will play a significant part in improv-ing quality of preparing future teachers in terms of informatization of education.

Research idea: it is necessary to update the ex-isting forms of organizing training process within an institution, methods and didactic principles, and create new ones in order set up an efficient system of preparing pedagogic institution students for their professional activity on developing intellectual abilities of school students via means of ICT.

Research goal: theoretic-methodological foun-dation and development of a didactic scheme and technology of organizing educational process in a pedagogic institution so that future teachers are pre-pared for developing components of intellectual ac-tivity among students. These components are: high level of forming elementary thinking operations (analysis, synthesis, comparison, analogy, abstrac-tion, classification, etc.), activeness and unordinary way of thinking, self-organization and purposeful-ness of thinking.

Research objectives:

1. Establish a condition of the problem of train-ing future secondary school teachers for work on developing intellectual abilities of students via means of ICT.
2. Develop a concept of professional prepara-tion of future teachers for work on developing intel-lectual abilities of school student with implementa-tion of ICT.
3. Develop a theoretic model of future teachers' readiness for work on developing intellectual abili-ties of school students with implementation of ICT that will include motivational-need, supporting, operational-procedural, and evaluative component.
4. Reveal pedagogic conditions that provide for the efficiency of professional training of future teachers for their work on developing intellectual abilities of students via means of ICT.
5. Define and develop a didactic system of pro-fessional training of future teachers for work on developing intellectual abilities of school students with implementation of ICT.
6. Develop a technology of organizing educa-tional process that is directed towards professional training of future teachers for developing intellec-tual abilities of school students via means of ICT.

Scientific novelty of the research is defined by the following aspects:

- Theoretical-methodologic basics of profes-sional training of future teachers for their work on developing intellectual abilities of school students with implementation of ICT will be defined;
- A concept that will provide for realizing pro-fessional training of future teachers for their work on developing intellectual abilities of school students with implementation of ICT will be developed;
- A model of professional readiness of future teachers for work on developing intellectual abili-ties of school students with implementation of ICT will be developed;
- Pedagogic conditions that provide for the ef-ficiency of professional training of future teachers for work on developing intellectual abilities of school students with implementation of ICT in a single ped-agogic process of an institution will be revealed;
- Didactic system and contents of methodical work on professional training of future teachers for their work on developing intellectual abilities of school students with implementation of ICT will be developed;
- A new technology of gradual professional training of future teachers for using ICT will be introduced, and its efficiency will be confirmed by test-experimental method.

Applicatory significance of the research is defined by the fact that theoretical conclusions and scientific-methodological recommendations, pro-vided by the article, can find their implementation in activity of pedagogic educational institutions on improving professional preparation of future sec-ondary school teachers for developing intellectual abilities of school students using ICT. Realization of the results of this study will allow us to increase the quality of professional training of future teach-ers as it will provide for the formation of intellec-tual skills that are didactic basis of the development of intellectual abilities among school students via means of ICT. A new conceptual approach towards solving the problem of professional training of fu-ture teachers for their work on developing intellec-tual abilities of school students with implementa-tion of ICT at the institutional stage of education that includes a concept and a model, pedagogic con-ditions, didactic system, technology of organizing educational process will be developed.

References

1. National action plan for 2012–2016 on developing func-tional literacy of school students. Astana, 11/07/2012.
2. State programme of education development in Republic Kazakhstan for the period 2011–2020, Astana, 11/07/2012.
3. Speech of Minister of education and science of Republic Kazakhstan B.T. Zhumagulov during the Representative hour in Parli-ament of Republic Kazakhstan «On the flow of realization of State programme of education development and problems of education and science system for the closest period». – Astana, 07/12/2010.
4. Kostyuk N.V. Development of positive motivation for studying among students of basic professional education: disser-tation for candidate of psychology. – M., 2005. – 189 p.

5. Shornikova G.N. Development of intellectual skills among students within educational process: dissertation for candidate of pedagogy. – Yuzho-Sakhalinsk, 2002. – 192 p.

6. Balykbayev T.O. Theoretic-methodological basics of informational model of forming student contingent of higher educational institutions: author's abstract for the doctor of pedagogy. – Almaty, 2003. – 32 p.

7. Tulbasova B.K. Didactic conditions of training teachers for using informational training technologies in institutes of refresher training: author's abstract for candidate of pedagogy. – Almaty, 2000. – 24 p.

8. Begarisheva G.G. The system of gradual preparation of teachers for using informational technologies in their professional activity: authors abstract for candidate of pedagogy. – Almaty, 2001. – 26 p.

9. R.O. Djeranova Didactic conditions of forming computer-training skills of a future teacher in an institution (at the example of subjects: computer study, maths, physics): author's abstract for the candidate of pedagogy. – Shymkent, 2002. – 23 p.

10. Adilova N.A. Implementation of innovative technologies of training in developing intellectual culture of students: author's abstract for candidate of pedagogy. – Astana, 2006. – 32p.

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A UNIVERSITY TEACHER AS A SUBJECTIVE UNIT OF PEDAGOGICAL PROCESS INFLUENCING THE QUALITY OF DIDACTIC SYSTEM

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Transformations, taking place in all the spheres of Russian Society, have raised a problem of improving and developing education. Interaction of subjects in educational process in the university plays a very important role in solving this problem, as well as competence of a teacher, affecting both educational process and its final result – the quality of education. This paper describes the problems in formation of interaction between students and teachers and charts the ways of improvement of the effectiveness of educational process.

Formation of a certain image of a teacher in student's consciousness plays a great role in solving the problem in question. The image of a teacher actively influences different aspects of interaction, and cooperation with students. The effectiveness of educational process depends on the competence of the teacher and the way students percept him. A number of researchers (P.G. Belkin, A.I. Vyrazhenskaya, P.V. Kartsev, S.V. Kondratjeva, N.V. Kuzmina etc.) point out, that in many cases social and perceptive processes are dominating in forming the interaction between the students and teachers both in educational and scientific spheres.

The analysis of literature concerning the problem of forming the image of a teacher in student's consciousness showed that this problem is insuff-

ficiently developed. In particular, some aspects remain unresolved – mechanisms of intergroup and interpersonal perception in communication, decisive effect of first impression which defines further cooperation, the role of appearance, the concepts (or stereotypes) of an ideal teacher etc.

It should be pointed out, that stereotyping plays a very important role in forming the first impression about a person. The way the students percept the teacher when they meet him first time is often based on a small quantity of information, and is under the strong influence of previous notions, attitudes, and experience the students have had. It's clear that in this situation, with a shortage of information about the personal qualities of a teacher, the student correlates the teacher's image to the classification of personalities based on his own daily interpersonal interaction. In such a situation there may be discrepancies between the real «psychological portrait» of a certain teacher and the image that a student formed in his consciousness, moreover, the subjective perception of individual characteristics of a teacher is filled in every situation differently. The more the partners are interested in communication, the less neutral their situation is. In such a case perceptual errors and mistakes concerning the choice of techniques of further interaction occur more often. In cases when students meet the teacher, whose subject does not have any test control in the near future, they «draw» his «psychological portrait» more or less precisely. If there is a credit in an easy subject (form the point of view of the students), perceptual errors, as a rule, increase. And if there is an examination, a teacher is related to the category of «sadists», «torturers», «kind simpletons», or «strict but fair».

The basic role in case of «hallo effect» belongs to a perceptual error called superiority factor, as a priori the teacher is educated better, he is frequently ascribed competence in scientific, personal and other issues, which are sometimes far beyond teaching.

Attractiveness factor is also a part of forming a first impression: attractive physical appearance, voice, manners of a teacher is perceived as more intelligent, interesting and fair, and the other way round. However, individual perception of each student, on the one hand, is stereotyped, which allows to form «public opinion» about the teacher, and on the other hand, it is personal and unique, therefore, with more or less proportion of comfort, creates peculiar percept-image.

To achieve success, a teacher must have certain professional knowledge skills and abilities:

1. To be a man of great erudition.
2. To know the subject well.
3. To be able to select educational material independently.
4. To select optional and effective means and methods of teaching.
5. To be able to create motivation.
6. To be severe on the knowledge of the students.

7. To be logical and have a copious vocabulary.
8. To be good at reflection.
9. To be a man of quick observation and to be able to understand students.

It should be noted that educational knowledge and skills considerably improve the efficiency of teaching profession. Being an intelligent person is one of the most frequently mentioned characteristics among the students when they evaluate the teacher they respect. When the teacher expresses his thoughts with ambiguity, it leads to ambiguity of his speech, and consequently, to misunderstanding with students.

The attitude towards criticism is also important. A teacher must give a student an opportunity to express his opinion, even in brief. The best moment for doing it is a seminar or a break. A scientific dispute in comparison with the dispute of know-nothing people must be based only on logical arguments and certain facts.

Personal attitude must not interfere with impartial assessment, it is very important. Some students, especially women students, sometimes try to influence the teacher by scent.

None of the forms of in-class learning, including lectures, deprives the teacher of the opportunity to show his attitude to the students. Then the third factor, one of the strongest, which influences «the first impression image», can take place – the factor of personal attitude to us. As a rule, we positively judge people who are well disposed towards us, then those, who do not demonstrate it. And we often criticize those who dislike us. The factor of the attitude to us, which initializes the corresponding pattern of perception, is often conditioned by agreement or disagreement of a partner with our point of view.

Speaking about the factors forming the first impression, one can't help mentioning such aspect of information about the person as clothing, because public attitudes compel us to «read» different personal traits via certain combinations of style, colour and even the quality of dress material (M.I. Kiloshenko etc.). A suit, according to the research of N.L. Shlykova, takes only the fourth position (after speech, gestures and face) in influencing the perception of the teacher by the students, nevertheless, it is also significant when forming the image of a teacher.

Thus, we can come to the conclusion that the perception of the teacher by the students during the first contact is based on the mechanisms of intergroup communication, where social stereotyping plays important role. As for further interaction, mechanisms of interpersonal communication are advanced to the forefront; these are identification, empathy and reflection. Studying the role of these phenomena in «teacher-students» interaction was beyond the scope of this research, as a high level of empathy and reflection development is an axiom of a teacher's success. Besides, during the conversations with teachers we often heard that students give more sympathies to those teachers, who «look like them» (for example, they have similar outlooks on life, sometimes use youth lexis).

All the educational process, as well as education depends on the means of pedagogical impact applied by the teacher. Speech is the main means of pedagogical impact. A university teacher must have a high level of linguistic culture, a copious vocabulary, expressiveness, intonational patterns and enunciate correctly.

The profession of a teacher is the most widespread in the sphere of skilled labour: there are more than 3 million teachers in Russia, half of them are school teachers. Almost 20% of Russians with higher education have pedagogical education, with two thirds of women among them.

Pedagogical community is constantly growing and developing. In the second half of the 20th century the amount of teachers on the planet more than doubled. It is also known that only the two thirds of specialists coming work at school, stay there for a long time. It can be accounted for the fact that despite its obvious mass character, this profession makes high demands on its representatives.

Peculiarity of psychology (the ability to percept and digest first of all emotionally coloured information) requires constant expressiveness of the teacher, it sufficiently increases physical and mental work load. It is not by chance that the profession of a teacher, along with flight dispatchers, firemen, and rescuers is in risk group due to the factor of emotional work load.

A teacher in students' group is to some extent both a director and an actor, because each class is a kind of a performance. Besides, a teacher must be a leader who controls the group of students, which means he must also be a manager. (it should be pointed out that in the West that «managing a group of students» is a compulsory characteristic for a teacher and is one of the parameters of evaluating his work).

Finally, a teacher must be competent in his subject area. Only in this case he will be able to concentrate on the contents and its «arrangement», on organizing the students' activities.

A teacher is example to follow, in accordance with the pattern of his behavior they subconsciously build up their own behavior. There is a notion of «significant other» in the national science. This is a person who is example to follow, whose values we accept. From the very beginning of a students' life a teacher is the person, who is most significant for students. Therefore the morale of a teacher must correspond to the demands he makes to the students. While forming the students' moral guides, the teacher turns them upon honesty, kindness, justice; at the same time the teacher is confronted with life outside the educational institution, and sometimes even inside it. In such conditions the most effective method of persuading students and neutralizing negative examples is value system of the teacher. Both now and always teachers were allotted a difficult task to «protect» and «recover» students from soullessness, falseness and double standards. But only the teacher who sincerely likes and respects the personality of a student (implicitly admitting his rights and dignity) can do it successfully.

References

1. Kazaryants K.E. Monitoring in the Conditions of Innovative Educational Work of a University Teacher // *Fundamental Research*. – 2008. – № 9.

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HUMANITARIAN ORIENTATION OF THE PERSONALITY OF UNIVERSITY STUDENTS OF TECHNICAL SPECIALTIES AS CARRIERS OF RUSSIAN CULTURE

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The article is the research of humanitarian orientation of the personality of university students of technical specialties, who are the carriers of their country's culture. Culture influences the formation of man's personal qualities and behaviour. The study of the uniqueness of culture of the South Ural will allow to understand valuable orientations and senses of the students who are trained here – humanitarian orientation of their personality. On the basis of the South Ural's culture the education of schoolchildren and students, including of technical specialties, is built. Formed humanitarian orientation conducts the knowledge of the person himself, ability to cooperate and work in team. Article gives poll data of students about sense and meaning of their life and main positive qualities of people for them. The presented diagrams reflect results of the pedagogical experiment on formation of the humanitarian orientation of the personality of university students of technical specialties. There is also the characteristic of changes in the personality of students of experimental group as a result of approbation of the developed system on formation of the humanitarian orientation of the personality and the carefully picked up complex of pedagogical conditions.

Introduction

Culture is the indicator of the development of society during its different historical periods, because it includes values, which characterize society at each stage of its development. It is the experience of mankind saved up and transferred from one generation of people to another during the process of life activity. The carrier of culture is the personality, which keeps in itself norms and values, accepted in the society and checked for centuries.

Russian culture is the all-human, open and deprived of the concept of the absolute evil; it provides the human attitude towards the representatives of other cultures and people, and to carriers of Russian culture – high flexibility and ability to cause to itself long-term sympathy. Culture forms the person and his personal qualities purposefully,

«culture is practical realization of universal and spiritual values» [1, p. 66].

The personal beginning is formed via mechanisms of choice of this or that type of behaviour, values and senses. Youthful age is a sensitive period for formation of the valuable and sense sphere [3]; this age coincides with choice of profession and training at the university. This is the time of formation of future highly qualified specialist and leader, who possesses not only high level of intellect, but formed life-sense orientations, high level of self-actualization [4], personally significant characteristics and reflexivity. All this characterizes the humanitarian orientation of the future specialist of technical profile, his/her ability to work in team, direct people, resolve conflicts and disputes, understand people.

We understand the organizing property of the personality formed by means of education and training as a humanitarian orientation of the personality, developing the superior human qualities, having as its substantial side life-sense orientations and providing high level of manifestation of professional competence.

Achievement of integrity of knowledge of the person, society and nature, understanding of meaning of universal values in the modern world, understanding the place in the world, development of cultural consciousness, abilities and opportunities to reforming cultural activity are important for any young people including the university students of technical specialties as carriers of culture of Russia.

Culture and history of the South Ural is the culture and history of all peoples who have been living on its territory from ancient times. Ethnographers note ethnic complexity, heterogeneity of the structure of the population of the South Ural. All people settled here in different time, contributed to its culture. There are representatives of more than 100 nationalities living in the South Ural: Russians (majority), Tatars, Bashkirs, Ukrainians, Kazakhs, Germans, Belarusians, Mordvins, Nagaibaks, Chuvashs, Gypsies, Jews, Maris, Udmurts, Moldavians, Georgians, Kyrgyz, Armenians, Tadjiks, Azerbaijanians, Uzbeks, Poles, Koreans, Bulgarians, Chechens, Greeks, Lezghians, Turks, Vietnamese, Ossetins, Avars, Lithuanians, Estonians, Komi-Permyaks, Dargins and other nationalities.

The contribution of Ural to the culture of Russia, on which the basis of education of schoolchildren and students is built, is original [2]. The base of arts and crafts of Ural is industry namely Ural stone-cutting art, marble processing, production of various pig-iron household goods, iron casting in the architecture and industry. Kasli and Kusa iron casting and Zlatoust engraving on steel are widely known in Russia and abroad.

Keen interest in semi-precious stones caused development of stone-cutting, including jeweler art. Special pride of the southern Ural masters is stone panels, created by the artists of this region by means of the paints prepared from semiprecious stones.

Such writers and poets of the South Ural as Mikhail Lvov, Lyudmila Tatyanchikova, Yuri Libedinsky, Lidia Seyfullina, Konstantin Skvortsov, Anatoly Klimov, Anatoly Dementiev created novels, poems, drama works written with love to the native land – its nature, people of special character, mighty industry and culture.

All schoolchildren of the South Ural know tales (skazi) by Pavel Bazhov, whose work is connected with our region: «Malachite casket», «Stone flower», «Mountain master», «Copper mountain hostess» and others. Telling about the art of Ural handymen, reflecting beauty and originality of old mountain-factory life, Bazhov also brings up subjects of work, creative searches, love, fidelity, freedom from the power of gold and others, that is of true moral, spiritual beauty, values of the person.

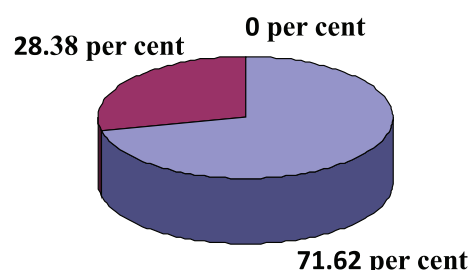
Poll carried out by us, in which 115 first- and second-year students of technical specialties of the branch of SUSU in mountain-factory region in town Asha took part, showed that the most important values of the person for them are honesty (46,09 per cent), kindness (37,39 per cent), sincerity (15,65 per cent), respect for people (10,43 per cent) and mind (8,7 per cent). Also there were such answers as devotion, openness, sense of humour, decency, sociability etc. Only 4,35 per cent consider important the ability to help other people, 3,48 per cent – ability to listen, 3,48 per cent – responsibility, 2,61 per cent – diligence, 1,74 per cent – reliability, but after all these values of the person define him as a specialist who can work in a team. The sense of life for students is family creation (23,48 per cent), education (22,61 per cent), finding work with good salary (18,26 per cent) and statement and achievement of the objectives (16,52 per cent). Only 1,74 per cent of all respondents named health of parents, 2,61 per cent – to give happiness and good to other people, 1,74 per cent – to have friends, significant for them; 23,48 per cent don't think of sense and value of their lives.

Thus, modern students are concerned, first of all, about personal wellbeing; public interests aren't priority for them, which is a consequence of social changes in society. Material values, the cult of money replace true values with false ones, lead to violation of social norms and deviations in behaviour.

To avoid this it is necessary to form the humanitarian orientation of students' personality at lessons of humanitarian disciplines, because technical disciplines don't bring up universal questions of sense of life, the good and evil, love and hatred, the attitude towards other people. The special role is given to the humanitarian environment of the university, which includes art exhibition hall, where the exhibitions of famous artists constantly take place. In the assembly hall concerts of the well-known musicians take place. The virtual library offers walks in the Tretyakov art gallery, the Hermitage, the Pushkin museum which is very valuable in education of students of all specialties.

The pedagogical experiment carried out by us, the developed system, which can be used in the education and pedagogical correction of the personality of students of any specialties and also students of secondary vocational schools and schoolchildren, and carefully selected pedagogical conditions of its effective functioning allowed to raise the level of the humanitarian orientation of the personality (HOP) of students of technical specialties considerably within the discipline «The Foreign Language» (fig. 1, 2).

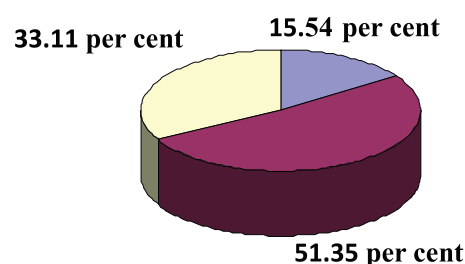
Zero cut



■ Low level ■ Medium level ■ High level

Fig. 1. Percentage ratio of number of respondents with low, medium and high level of HOP on zero cut

Total cut



■ Low level ■ Medium level ■ High level

Fig. 2. Percentage ratio of number of respondents with low, medium and high level of HOP on total cut

In the group where the system was used entirely against all pedagogical conditions, the students became more emotional, sensitive; imagination, esthetic taste and intuition began to develop at them more dynamically. They became more conscious and capable to self-analysis. Students learned to perceive new information easier, to criticize old, become obsolete, and to aspire to experiment; they

became more intense, diligent, and increased desire to make the task better, in comparison with results on the beginning of the experiment. Students of this group learned to realize more distinctly the purposes of the future which give their lives intelligence, orientation and temporary prospect more distinctly; they became more internal, responsible and socially mature. Their level of understanding themselves and ability to argue the point of view rose. The students began to reflex their acts and relations better. In other experimental groups where the system was used taking into account any one pedagogical condition, such essential changes were not revealed. In the control group where the purposeful formation of the humanitarian orientation of the personality of students of technical specialties was not occurred, on the contrary, there is dynamics to decrease in level of reflexivity and humanitarian orientation.

So, we can conclude that only professional-technical education doesn't lead to formation of life-sense orientations, personal maturity and self-actualization; without purposeful development of humanitarian orientation, which includes development of cultural values of the people, understanding the sense of own life, the students of technical specialties generally displayed themselves as external persons; they don't realize their potential and think a little about sense of life, that, in turn, can lead to decrease in the level of their culture.

References

1. Vyzhletsov G.P. Axiology of culture: the monograph. – StPb.: StPbSU, 1996. – 152 p.
2. Legends of South Ural / Comp. I.A. Kirillova. – Chelyabinsk: Arkaim, 2010. – 4th edit. – 208 p.
3. Shchelokova E.G. Career orientation and features of the structural organization of valuable-sense characteristics of students of university of different professional training. Psychology in the modern developing world: theory and practice: Materials of Intern. Scientific pract. conf. – Chelyabinsk: SUSU, 2012. – P. 237–243.
4. Yashchenko E.F. Valuable-sense concept of self-actualization: monograph. – Chelyabinsk: Publishing house of SUSU, 2005. – 383 p.

The work is submitted to the International Scientific Conference «Cultural heritage of Russia and the modern world», London, October, 19-26, 2013, came to the editorial office on 09.10.2013.

INTEGRATION AS INNOVATIVE TECHNOLOGY IN TEACHING OF CLINICAL DISCIPLINES

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One of the innovative technologies implemented in Semey State Medical University is interdisciplinary integration. Vertical integration between basic subjects and clinical disciplines and horizontal integration of related subjects are very important in medical education because it provides deep under-

standing and real conditions of medical practice. Integration is realized in integration lectures, practical lessons and symposiums.

This study is about analysis of efficiency of integration (vertical and horizontal) in teaching of clinical disciplines.

We analyzed feed back of students and teachers about horizontal and vertical integration. 40 students and 40 teachers were surveyed. Profiles processed by statistical methods.

Analysis of student's answers revealed that integration helps to develop competencies as «knowledge and understanding in study area» in 87,5%; «practical skills» – 67,5%; «clinical thinking» – 77,5%; «communication skills» – 62,5%; «skills of scientific research» – 42,5%; «team work skills» – 70%. 12,5% of respondents answered «nothing competencies», 10% – «difficult to answer». 85% of the respondents are interested by this technology of teaching, 5% are not interested, 10% – do not know. The average estimation score was 3,33 to 4 point scale.

Teachers marked that integration helps to develop the following competencies: «knowledge and understanding in study area» in 85%; «practical skills» – 75%; «clinical thinking» – 82,5%; «communication skills» – 77,5%; «skills of scientific research» – 65%; «team work skills» – 87,5%; «nothing competencies» – 7,5%, «difficult to answer» – 10%. On question «Did you like practical lesson conducted by integration» 5% of teachers had difficulty in answering, 7,5% of respondents didn't like, and 87,5% pleased this practical lesson. Teachers put the overage mark of this technology – 3,67 to 4 point scale.

This study suggests that this technology allows deepening of knowledge, increases motivation of students, responsibility, improves communication and teamwork skills, clinical thinking, reveals leadership. Vertical and horizontal integration is very useful technology for teaching in clinical disciplines. It creates real conditions of medical practice of any doctor.

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EVIDENCE BASED MEDICINE AS AN INSTRUMENT FOR THE STUDY OF INTERNAL MEDICINE

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The present time the proper medical practice, healthcare organizations and research activity requires the ability to critically and competently

evaluate the results of the latest scientific and clinical research. It is necessary to stimulate the clinical and scientific thinking of the students, the use of interdisciplinary approaches for the acquisition of knowledge and skills. Currently, evidence-based medicine is a mandatory educational discipline for the third year students in accordance with Kazakhstan educational standards. Semey State Medical University actively implements of the method of integration of disciplines «Internal Medicine» and «Evidence-based medicine» to improve the skills of students in determining the optimal methods of diagnosis, treatment and prevention of disease in a particular patient in a concrete situation. The forms of such integration could be different. They include

1. Selection of optimal methods of diagnosis, treatment, prevention using case based learning method (CBL). In the clinical department the students under the guidance of teacher perform examination of the patient, an analysis of the examination results, define the clinical problem and discuss the reasonable tactic for examination and treatment. Then they confirm their opinion using the databases of evidence based medicine. For the searching of the necessary information the students use method (patient/population, intervention, comparison, outcome), define the key words to search the proper scientific based information in the different data bases including PubMed, MEDLINE, EBSCO, International Clinical guidance. Our students have very good possibility to use The Cochrane library. Then the students demonstrate the found information, discuss it and analyze the results of work.

2. Using the knowledge of evidence-based medicine in the independent student work for the description of clinical cases, presentations and essay.

3. Demonstration of knowledge in the clinical conferences and clinical symposia for discussion the most difficult and controversial clinical situations. In this case, the assessment of evidence-based medicine knowledge and skills is held by the expert in the field of evidence-based medicine

Analysis of the feedback from the students showed that almost 100 % of them said that integration of evidence-based medicine and internal medicine is helpful to improve their knowledge and understanding in the field of study, research skills, critical and clinical thinking, 80 % said that such learning improves their communication skills and teamwork skills. Only 10 % of students reported difficulty in finding of relevant information due to lack of good knowledge of English.

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IMPORTANCE OF INFORMATION IN MANAGEMENT OF EDUCATIONAL SYSTEM

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This article discusses the role of communication in the activity Manager of education. Today management plays a considerable role in the education system. According to the research most of the time the manager spends on communication. In the system of education communication plays essential role as with its help the information is trans

Today management plays a considerable role in the society. Because during several decades the human activity is accompanied by row of continuous changes in social, political, economic and other spheres of social life which in their turn demand changes in us. Their main part as the world experience shows is comprehension of science and art of management.

Management is defined as a skill to achieve aims using labour, intellect and motives of other people's behavior, as a type of activity in managing people in organizations, and as a sphere of human knowledge which allows executing this function. I.e. the core of contemporary management means that in the one hand it originates from a person, his needs and aims, from transformation of knowledge, experience and achievements in science and technical progress into productive power and in the other hand the creative power of managing consists in using informational technologies. Contemporary managers attach a special importance to group work and cooperation treating the employees as partners and not as subordinates.

Management in contemporary science is regarded as the process because the work on achieving aims with the help of others is not a nonrecurring action but a series of interconnected ceaseless actions each of which is the process and furthermore very important for success of the organization.

According to the research the manager spends from 50 till 90% of all time on communication. The manager does it in order to realize his roles in interpersonal relations, informational exchange and processes of making decisions, saying nothing of management functions of planning, organizing, motivating and control. And just because the exchange of information is included into the main types of management activity, communications are called connecting process and their effectiveness plays a significant role for success of people and organizations [3].

In the system of education communication plays essential role as with its help the information is transferred both from manager to subordinates and vice versa and from teachers to children. There are several types of communications in offices and in educational systems.

Communications between organization and its environment.

The activity of organizations in educational system is influenced by the factors of external environment (political, social, cultural and etc.). Communicational needs of organization depend on these factors. If there was a necessity to analyze what is really being spoken, written and read in organizations, the main attention would have to be concentrated on the questions connected with the needs of informational interaction with external environment which influences or will influence on the organization.

Information is moving around inside the organization from level to level within the frames of vertical communication. It can be transferred downwards, i.e. from top levels to lower ones. This way the subordinate levels of management are informed about current tasks, change of priorities, concrete targets, and recommendable procedures and so on.

Transference of the information from lower levels to top ones may noticeably influence on quality of education.

Besides that upward communications also fulfill the function of informing top levels about what is being done at lower levels. This way the administration finds out about current or brewing problems and suggests possible variants of correcting the state of affairs. The exchange of information upwards usually happens in the form of accounts, suggestions and explanatory notes.

In addition to the informational exchange downwards or upwards the organizations need horizontal communications. Organization consists of numerous divisions, that is why the informational exchange is necessary for co-ordination of tasks and actions. Since organization is a system of interconnected elements administration should achieve collective work of the specialized elements promoting organization in necessary direction.

For example representatives of different departments in an educational institution periodically exchange information with each other in such questions as making schedules, level of demands for undergraduates in the programs, cooperation in researching and consulting. This allows organization retaining nearness to consumer and continuing effectively satisfying his demands. This way, operative workers should give reasons of quite low expenses for realization of future innovations of project and research department so that further production was reasonable. In horizontal informational exchange usually take part committees and specialized groups.

Additional advantages of horizontal communications consist in forming equitable relations. It is proven that these relations are important constituent of contentment of employees in education system.

One of the components of communications in organization is relations between a manager and subordinates. The researches reveal that two third of this activity is fulfilled by managers and subordinates [1].

Some of numerous types of informational exchange between manager and subordinates are con-

nected with clarification of the tasks, priorities and expected results, with providing involvement into taking decisions of the tasks in educational institutions, with discussion of the problems of work effectiveness, with achieving of admission and award aiming at motivation, with elaboration and development of subordinates' skills, with accumulation of information about brewing or really existing problem, with announcement of subordinate about future changes, and with getting data about ideas, improvements and suggestions.

In addition to informational exchange between manager and subordinate there takes place the exchange between manager and his work group. The communications with work group in general allow manager to raise the effectiveness of the group's actions. Since in the exchange take part all the members of the group everybody has the possibility to ponder upon new tasks and priorities of educational institution, upon the way they should work together, upon forthcoming changes and possible consequences for this and other institutions, upon recent problems, achievements and suggestions of innovative character.

Besides that sometimes the work group gathers together without managers for discussion of the problems, improvements and oncoming changes. Such equal relations may contribute to raising the contentment of the co-workers with their work.

Organization consists of formal and informal components. The channel of informal communications may be called the channel of gossip spreading. The information is transferred much faster through channels of gossips than through channels of formal communications.

The reputation of inaccurate information assigned to gossips is preserved till nowadays. Nevertheless the researches reveal that information transferred through channels of informal communication, i.e. gossips, is usually accurate but not distorted.

The informational exchange comprises different part of organization, and it correlates with effectiveness of information. It is notorious that the exchange of information in organizations is not as effective as it should be. In reality people communicate less effectively than it seems to them.

During the exchange both sides play the active role. For example if you as a manager describe the way work should be changed to someone of your subordinates it is only the beginning of exchange. To make the informational exchange effective your subordinate should convey his understanding of the task and your expectations according to the results of his activity. Informational exchange happens only in case that one side «suggests» information and another perceives it. To fulfill it exactly this way one should pay special attention to communication process.

Communication process is informational exchange between two or more people.

The main purpose of communication process is to guarantee the understanding of information

which is the subject of exchange, i.e. messages. In the process of informational exchange there may be distinguished four basic elements [2]:

1. Sender is a person generating ideas or accumulating information and transferring it;
2. Message is just an information encoded with symbols;
3. Channel is means of transferring information;
4. Receiver is a person for whom the information is dedicated and who interprets it.

While exchanging the information sender and receiver go through several interconnected stages aimed at composing a message and using a channel for transferring it so that both sides understood it and followed the original idea:

1. Conceiving an idea;
2. Encoding and choosing a channel;
3. Transferring;
4. Decoding.

The informational exchange begins with enunciation of the idea or selection of the information. Sender decides which significant idea or message should be made as a subject of exchange. It is important to remember that the idea is not yet transformed into words or has not got the shape in which it will serve the exchange of information. Sender decided only what conception he wanted to make the subject of informational exchange. To fulfill the exchange effectively he needs to take into account numerous factors. For example manager who wants to exchange the information about evaluation of the results of work must understand that the idea consists in informing subordinates about the concrete information of their weak and strong sides and about the way to improve the results of their work. Thus it is necessary to realize what ideas are dedicated to transference before you send a message and assurance in adequacy and relevance of your ideas taking into account concrete situation and aim.

Before transferring an idea sender must encode it with symbols using words, intonation and gestures (body language) for it. Such encoding transforms the idea into a message.

Senders must also choose a channel compatible with the type of symbols used for encoding. To some of the well-known channels refer the transference of speech and written materials as well as electronic connection including computer network, e-mail, videotapes and videoconferences. If a channel is improper for physical transformation of symbols the transference is impossible. If a channel doesn't correspond to the idea conceived at the first stage the informational exchange will be less effective. For example a manager wants to warn a subordinate about illicitness of his committing the violations of safety measures and does it during easy talk with cup of coffee or sending him a note on this occasion. However through these channels it won't probably succeed to transfer the idea of seriousness of these violations as effectively as in official letter or at the conference. Similarly sending a note to

the subordinate about the distinction of her achievements won't transfer the idea of the importance of her contribution to work and it won't be as effective as direct talk with following official letter of appreciation and with award as well.

The choice of transference means shouldn't be limited with one channel. It is often advisable to use two or more means of communication in combination. The researches reveal that simultaneous usage of exchange means of oral and written information is usually more effective than let it say only exchange of written information. Discussing the results of this research professor Torrens Mitchell points out the main conclusion of this work – the combination of oral and written message does the informational exchange more effective in most of the cases.

At the third stage sender uses the channel for delivering the message (encoded idea or complex of ideas) to receiver. The question is about physical transference of the message which many people take by mistake for the very process of communication. At the same time the transference is one of the primary stages which are necessary to go through to inform somebody of the idea.

When the sender has transferred the message the receiver decodes it. Decoding is translation of sender's symbols into receiver's thoughts. If the symbols chosen by the sender have equal meaning for receiver, the last will know what the sender meant when couching his idea. If the reaction to the idea is not necessary the process of informational exchange should be over. However for a number of reasons the receiver may attach a bit different meaning to a message than the sender had. From manager's point of view the informational exchange should be considered effective if the receiver demonstrates the understanding of the idea producing an action which was expected by the sender [2].

In case of feedback, sender and receiver exchange communicative roles. Former receiver becomes sender and goes through all stages of the process of informational exchange to transfer his response to former sender who now plays the role of receiver.

Feedback may promote to increase the effectiveness of exchange of administrative information. According to row of researches two-way informational exchange (in case of possibility of feedback) in comparison to one-way exchange (feedback is absent) though it proceeds slower. Nevertheless it relieves stresses more effectively, it is more accurate and it raises the confidence in correctness of message interpretation.

Feedback noticeably raises the chances for effective informational exchange allowing both sides to suppress the noise. In the language of theory of informational transference the noise is called everything that distorts the meaning. The resources of noise that may create the blocks on the way of informational exchange vary from language (in verbal or non-verbal form) to differences in perception because of which the meaning in the processes

of encoding and decoding may change and to the differences in organizational status between manager and subordinates who may obstruct the correct transference of the information.

Definite noises always occur that is why at every stage in the process of informational exchange happens some distortion of the meaning. High level of noise will lead to noticeable loss of meaning and may completely block the attempt to establish the informational exchange. From the manager's position this should determine the decrease of degree in achieving the aims according to transferred information.

All available informational systems in organization are the result of realization of accepted informational politics. Real creation of organization in educational system oriented to effective work with information occur only when politics in the sphere of informational technologies is considered by administration as natural element of activity and life of organization and is consciously ruled in appropriate way.

Thus, information for work of any educational institution is no less important than making decision, motivation or planning. The correctness of action at every administrative stage depends on the correctness of information, its adequacy and completeness. This means that for providing effective activity of organization the manager should take care of getting accurate data on base of which all the future work will be fulfilled.

References

1. *Economica I upravlenie kachestvom visshego obrazovaniya na baze informacionno-communicacionnyh tekhnologii obucheniya* / V.T. Volov. – Samara: Bahrah, 2007. – 204 p.
2. *Intellectualnie I innovacionnie tekhnologii v upravlenii obrazovaniem*. – Nevinnominsk: NIEUP, 2006. – 296 p.
3. Kravchenko A.I. The history of management. – M.: Akademicheskij Proekt, 2000. – 352 p.

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CAREER ORIENTATIONS OF STUDENTS AND LECTURERS: PRELIMINARY SURVEY

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The article contains general concepts of the career orientation proving the validity to the study of the content of the value system. It describes the guiding career orientations (Management, Entrepreneurship, Dedication to a cause, Professional competence), and the career vectors («Career up», «Career into») and their value content among the students and lecturers being the subjects of the system of higher education.

Modern social and cultural environment demands from a person who is the subject of professional activity not only specific competencies, but also the ability to realize their professional and career development. This ability helps the person to plan and to build his own life deliberately and efficiently without «making any drafts», to experience the subjective well-being and to self-actualize (Yashchenko, 2012). This is of the specific importance for the students who choose the certain area of professional training, the strategy of professional development and possible future career options (Lazorak, 2011). The career orientation which includes professional self-evaluation, motives and values plays a significant part in this process (Schein, 2006).

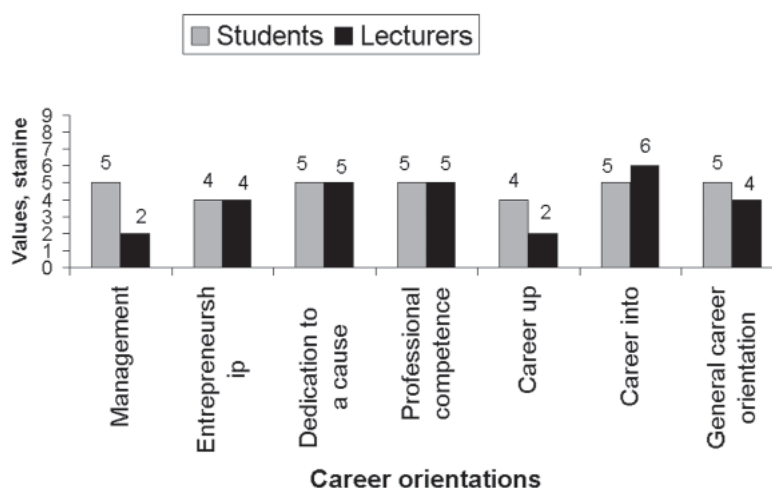
The study was carried out to consider the value content of career orientation in the system of higher education. The first purpose of the present study was to determine the preference in career orientation of modern Russian students ($n = 673$) and lecturers ($n = 38$). Figure 1 shows the average values (in the stanine) of career orientations of students and lecturers. All of the career orientations are equally preferable for students (4–5 stanine). The lecturers showed a low average score on the value of «Management» (2 stanine), other career orientations are equally preferable (4–5 stanine). In the group of students the difference in preference of various career vectors is insignificant (1 stanine), but in a group of lecturers this difference becomes significant (4 stanine): the vector «Career into» is more preferable (see Figure). Apparently, the students are still looking for professional development strategy, while the lecturers are experienced professionals who clearly understand the direction of their career development.

Table shows the distribution of respondents (students and lecturers) with high, medium and low levels of career orientations. Every fifth student has a high level of prominence in one or more career orientations, every third lecturer has a high level prominence in the career orientation «career into» («Dedication to a cause» and/or «Professional competence»), and only 8% of lecturers focus on «Management» and/or «Entrepreneurship». This tendency shows the following: among the students there are more respondents focused on vertical career line («Career up»), among the lecturers there are more respondents with a focus on the horizontal career line («Career into»). Possibly people with the desire to vocational and personal growth, and professional mastership (as lecturers) and people with career ambitions and the desire of promotion in social professional hierarchy (as students) come to the system of higher education.

The second purpose was to detect the relations between different career orientations and personal values of students and lecturers. Preliminary survey in the group of lecturers showed that the career orientation «Management» is positively correlated with the value «social interaction» ($p \leq 0,05$) and

with the sphere of physical activity ($p \leq 0,05$). The value of creativity has a positive correlation with the orientation «Dedication to a cause» ($p \leq 0,05$) and a negative correlation with the orientation «Entrepreneurship» ($p \leq 0,05$). In addition, the orientation «Dedication to a cause» has a negative correlation with the value of the material provisions ($p \leq 0,05$), and the orientation «Professional competence» has a negative correlation with the sphere of family life

($p \leq 0,05$), i.e. the career development on the type «Deep into» does not provide a realization of material and affiliation needs, which are considered the basic according to A. Maslow (1954). However, as it was indicated above (see Figure and Table), the orientation «Career into» is the dominant orientation for lecturers. It may show the crisis of professional development for some Russian lecturers in modern social and cultural environment.



The average values (in the stanine) of career orientations of students and lecturers

The classification of respondents (students and lecturers) with high, medium and low levels of career orientations

Level	Management	Entrepreneurship	Dedication to a cause	Professional competence	Career up	Career into	General career orientation
<i>Students</i>							
High	17,24 %	19,61 %	19,76 %	22,59 %	21,40 %	17,38 %	22,29 %
Medium	54,83 %	52,01 %	56,46 %	57,21 %	49,03 %	60,92 %	54,09 %
Low	27,79 %	27,64 %	22,88 %	19,91 %	29,57 %	21,69 %	23,63 %
<i>Lecturers</i>							
High	7,89 %	7,89 %	31,58 %	28,95 %	5,26 %	26,32 %	5,26 %
Medium	23,68 %	39,47 %	57,89 %	63,16 %	34,21 %	68,42 %	65,79 %
Low	68,42 %	52,63 %	10,53 %	7,89 %	55,26 %	5,26 %	28,95 %

Based on the results of correlation analysis in the students sample the values were defined that are most strongly associated with the career orientation «Management»: material provisions ($r = 0,386$; $p \leq 0,001$), achievement of the goals ($r = 0,351$; $p \leq 0,001$), prestige ($r = 0,285$; $p \leq 0,001$). The same values are most closely correlated with the career orientation «Entrepreneurship»: material provisions ($r = 0,308$; $p \leq 0,001$), prestige ($r = 0,260$; $p \leq 0,001$) and achievement of the goals ($r = 0,239$;

$p \leq 0,001$). The prevalence of social and pragmatic values of students with career orientations «Management» and «Entrepreneurship» which form the career vector «Career up» shows their commitment to the high level of material prosperity and their belief that material wealth is the main condition of life success and high self-esteem.

Other data was obtained by identifying the priority values that are correlated with career vector «Career into»: the values that are most strongly

associated with the career orientation «Dedication to a cause» are creativity ($r = 0,509$; $p \leq 0,001$), mental satisfaction ($r = 0,351$; $p \leq 0,001$), self-development ($r = 0,255$; $p \leq 0,001$); the values that are most strongly associated with the career orientation «Professional competence» are creativity ($r = 0,245$; $p \leq 0,001$), self-development ($r = 0,219$; $p \leq 0,001$), achievement of the goals ($r = 0,183$; $p \leq 0,001$). The predominance of religious and moral values of students with career orientations «Dedication to a cause» and «Professional competence» shows their desire for self-development, creative achievements in professional activity and realization of their personal and professional potential. Thus, the value priorities of the students with the career orientation «Career up» are the social and pragmatic values (material status, prestige, achievement), and the priorities of the students with the career orientation «Career into» are mental and moral values (self-development, mental satisfaction, creativity) (Shchelokova, 2012).

In this way the preliminary survey showed that the Russian students as a social group are equally focused on the different directions of the career development (Management, Entrepreneurship, Dedication to a cause, Professional competence). In further research we'll describe the differences in the career preferences of the students depending on the type of their professional qualification (technical, humanitarian, economic). The dominant career orientations of lecturers – «Dedication to a cause» and «Professional competence» correspond to the professional context of the higher education system, but they do not provide a realization of the basic material needs. Career orientation is closely connected with the sphere of values of a person and specific values different for various types of career orientations («Career into» – mental and moral values, «Career up» – social and pragmatic values).

References

1. Lazorak O.V. Analysis of significant distinctions of personal qualities of university students in the course of formation of life-sense orientations. *Vestnik of the university (State university of management)*. – M.: SUM, 2011. – № 21. – P. 63–65.
2. Maslow, A. *Motivation and personality*. – New York: Harper & Row, 1954. – 411 p.
3. Schein, Edgar H. *Career Anchors: Participant Workbook (Pfeiffer Essential Resources for Training and HR Professionals)*. 2006.
4. Shchelokova E.G. Value-semantic content of the career orientation: the thesis of Candidate of Psychology. – Chelyabinsk, 2012. – 243 p.
5. Yashchenko E.F. Self-actualization and subjective well-being as a socio-psychological problems of professional education: students and lecturers of university // *Journal of SUSU, series «Psychology»*. – Chelyabinsk, 2012. – № 31(290). – P. 56–63.

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CREATIVELY-DEVELOPING EDUCATIONAL SPACE AS A CONDITION OF FORMING AND DEVELOPING OF CREATIVE COMPETENCE OF A FUTURE TEACHER

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The article examines the phenomenon of «Creatively developing educational space, tendencies of development creatively developing educational space of pedagogical Institute in modern conditions of continuous pedagogical education of future teachers.

Tillers of intellectual gifts of a person can grow depending not only on a given «environment», but also on a predicted, ordered, organized totality of favourable conditions that create an atmosphere of collaboration and creativity. This part of pedagogic activity can be given a name – «creatively developing educational space» (CDES, TROP in Russian), or «TROPoshere». This abbreviated term contains a new meaning that differs from its traditional definition that is «integrated interactive unity of inspired search for the unknown, intellectual paradox, realized feeling of a discovery». Unlike «noosphere» by V.I. Vernadskiy, in other words, sphere of Mind or Universal Mind, TROPoshere is a layer of innovative noospheric education that provides for favourable conditions for collaboration, multi-dimensional self-realization, and creative self-development of teachers and students. However, this very layer feeds all participants of innovative educational process with spirits of creativity and valour of discoveries.

In Latin «trop» is a word or a phrase in an allegorical meaning [5, p. 271]. In this context of creative pedagogy abbreviative term «TROP» can be explained not only according to the first letters of basic characteristics of the projected professionalization space of a future teacher, but the term TROP also underlines the priority of a paradox, allegoric statement. A deep sense of such conclusions requires a persistent penetration into the essence of phenomena, in other words, creative searches of a person who possesses a refreshing quality of integral thinking.

Educational space absorbs social, upbringing, and also internal and external environment of each educational process subject. It is mainly defined by enriching educational-training process with the spirit of learning «co-operation and co-creation». In other words, educational space is human-filled shell of various educational systems. Only under such shell an atmosphere of free search for knowledge and means of activity can exist. Mechanisms of intellectual development – motivational setting and creative activity of a learning person are activated during the process of business collaboration.

Modern pedagogy studies educational space as an important factor that provides for social progress and self-realization of a person. However, in order to solve strategic problem of creative development and self-development, one has to create corresponding, creatively-developing educational space (similar to how a person lives within a single space of a country and, at the same time, within a space of a town or village that feed a city – megapolis and the country with the trained talented people). In order to establish TROP of an educational institution or certain educational system, it is necessary to transform environmental factors of social-psychological direction into spiritually-enriched atmosphere of trust and creativity via realizing innovative ideas of collaboration pedagogy. At the same time, TROP fills subject of educational process with energy of intellectual activity and initiative that define an intense broadening of general outlook, creative way of thinking, and innovative behavior.

TROP should be studied as an atmosphere of collaboration that is created by pedagogically-organized system that directs personality of a student towards its creative self-development.

Educational space of a system of continuous pedagogic education that has a defined material and technical infrastructure and provides for solving problems of a specialist's professional training, includes social-cultural space that provides for humanistic direction and person-oriented approach towards forming of professional competence of a future teacher. In its turn, TROPosphere, as a sub-space of social-cultural area, establishes the possibility of self-definition and selection of «individual educational route» according to typological aptitude towards different types of creativity and pedagogic activity.

Basic factors that influence productive integration of TROP and the process of pedagogic education are: increase in significance of pedagogy, innovative education, spiritual and moral values, directed towards forming a creative person; broadening of creative component of pedagogic education with a necessity to define principles and methods of eurilogical activity; significant transformation of the system of interaction between subjects of pedagogic professionalization from «teaching – learning» to collaboration within training-creative activity and increase in part of independent activity and transiting from study-research to scientific research activity of students.

One of important directions of the refreshed professionalization system can be usage of potential TROPosphere abilities through enriching the process of pedagogic professionalization of future teachers with atmosphere of collaboration. As a result, spiritual mood, integration of spiritual conditions that transforms into activity with realization of spiritual needs such as creative activity, efficiency of thinking and acting arise.

Motivation that integrates intrapersonal mechanisms of psychological space of a student-peda-

gogue also encourages him to act creatively. We can outline the following stimulus of activating professional development of a person within educational system: psychological influence of social-cultural space, need to know creative pedagogy and psychology, standard of creative pedagogic activity and personal self-realization, favourable environment. A skillful usage of the listed conditions can not only provide for a relatively high level of professional-creative competence development, but also create favourable conditions for creatively-enriched process of the whole pedagogic professionalization of a future teacher.

References

1. Belokopytova O.G. Didactic efforts of training social workers for creative activity within the process of their independent work in an institution: author's abstract of dissertation of candidate of pedagogy. – Cheboksary, 2002.
2. Bogoyavlenskaya D.B. Psychology of creative abilities. – Moscow, 2002.
3. Bodalev A.A. Psychology of communication: selection of psychologic works. – M.: Ed. Moscow psychologic-social institute; Voronezh, Ed. MODEK, 2002.
4. Gessen I.S. Basics of pedagogy. Introduction into applied philosophy / I.S. Gessen; ed. and drawn by P.F. Alekseyev. – M., 1995.
5. Kefin F. Dictionary of the most widespread foreign and rare Russian words. – Izhevsk: Ed. Todon, 1997.
6. Mitina L.M. Psychology of a teacher's professional development. – M.: Flinta, Moscow psychologic-social institute, 1998.
7. Kholodnaya M.A. Pedagogic psychology. – M., 2002.
8. Sokolnikov Y.P. On trends, prospects, and strategies of developing pedagogy at the modern stage. – Cheboksary, 2000.
9. Shadrikov V.D. Psychology of activity and abilities of a person. – M.: Logos, 1996.

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IMAGE ANALOGIES DRAWING METHOD – INNOVATION PEDAGOGICAL METHODOLOGY

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This article outlines the main principles and methods of the implementation of the original author's methodology for activation of students image thinking and heuristic abilities during the studies of philosophy and history of philosophy. This methodology improves the creativity thinking by enabling to find the image analogies to the abstract ideas. As an addition to the traditional methods of studying philosophy, it reveals the new possibilities for the fruitful and creative assimilation of the lectures by the students.

There are several reasons why the problem of knowledge visualization becomes extremely significant in modern pedagogy. First, the major part

of the information a human being obtains via vision. Second, modern youth, getting upbringing by overwhelming influence of mass media and Internet, can be invariably named a videogeneration. This is why oral information (a lecture, for example) that is accompanied by a visual material is accessed much better than the one without it. Third, modern students possess concrete(object) thinking, rather than abstract one, which they have still undeveloped. Philosophy is an abstract science. So there appears the necessity of adaptation of abstract philosophical ideas to the understanding level of an average student. How? One of the effective ways is the search for the image equivalent, translation of the verbal knowledge into visual form, associative comparison.

Studies of the philosophy course traditionally start with the historical-philosophical introduction. The problem is that during a relatively short period (1 semester) the students need to master a voluminous material to be acquainted with numerous philosophical trends, schools and persons. A new additional verified methodology is introduced for the optimization of the studying process. The students are offered to bring to philosophy seminars drawing accessorizes. While listening to the reports that last from 8 to 15 minutes, they perform a task of drawing the image of that particular philosophy they are being introduced to. From the beginning this task seems too obscure as everything new, yet it arises interest. Task specification: «Do not draw a philosopher portrait. Just underline by means of an image form the essentials of his worldview, draw what differs him from the others. Do not subscribe a philosopher name – the image itself must give the right clue for the recognition. Separate key words may be written, yet they must be a few and quite readable (in big letters)». After such an instruction the students start performing the task.

After the first report the students together with a lecturer analyze the first set of drawings revealing the essentials that must be invariably reflected in the images. In the case a reporter underlined the essentials and the students draw them, then the drawing becomes readable in every competent audience. After the initial analysis the lecturer offers the students the previous most successful drawings on the theme. It's very important to show the previous generation drawings not before, but after their own experience in order not to get just copies of the available patterns and to activate the personal creativity of the students. Every next drawing enlarges students experience in the activity performance. They listen to the reporter more attentively, start to differentiate the main and the minor, search for adequate images to graphic embodiment of the various philosophical ideas. On every subsequent drawing analysis the lecturer draws students attention at the archetypical images that are seen on the numerous drawings. In such a way the most important ideas of a particular school or a philosopher are being secured. The lecturer marks and withdraws the most

successful drawings into his collection of the methodical material, while the rest of them leaves with the authors to remind them about the ideas they fixed. These drawings can be used not only during the preparation to the exam or an assessment, but even during the exam as an image prompt giving key understanding to a person that worked a lot, but suddenly forgot or mixed the details. Those who want to detail their drawings, can do it at home. Besides, the students can use this method during their own preparation to a seminar. They like this creative work that eases them understanding of the abstract philosophical theories, because not only logic and the rational thinking left hemisphere of the brain are used, but the image thinking is being enabled. This methodology is particularly helpful to the students with difficulties in adjusting their way of thinking to the purely abstract ideas. They get additional (image) support to the rightful understanding and remembrance. Not only the product(drawings) is important, but the process of drawing itself, due to the activation of a student creative potential. That's why the most valuable is not the artist perfection and excellence of the drawing but the very process of transforming the philosophical ideas into the image equivalent, which every student must perform by his own means. A student obtains the possibility to show his creativity, his possibility to construct something new, and even, in some cases, to demonstrate his artistic talent. With the accumulation of the image drawings the lecturer obtains additional possibilities to secure the studied material and to examine the students.

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COMPARATIVE CHARACTERISTICS OF THE EDUCATIONAL CURRICULA IN THE FIELD OF ENVIRONMENTAL SCIENCE IN KAZAKHSTAN AND ENGLAND

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This article aims to study the comparative analysis of training programs Bachelor-ecologist of England and Kazakhstan on the example of the University of Northampton and Kh. Dosmukhamedov Atyrau State University. For example, we investigated differences in educational programs of two universities studied modules, amounts of credits these modules, and the list of modules in the training of specialists in the field of environmental protection. As a result, we have found that training of bachelors is in England for three years, and four years in Kazakhstan. In addition, in Kazakh

universities total for the whole period of study the student should achieve the 129 credits in all modules and at universities in the UK for the whole period of study students should master 360 credits. Consequently, the ratio of credits to the ECTS system it is in England 2 credits UK:1 credit ECTS, while in Kazakhstan it is inversely proportional to the ratio 1 credit RK: 1,4 credits ECTS. At the same time, thus the number of classroom hours per year at two universities about the same (540–585 in Kazakhstan and 552 hours in England respectively). The study found that the curriculum at the University of Northampton select educational programs related to Climate Change study, Landscape Ecology and Management of Waste, while the choice of Atyrau State University educational programs directed at a local training area to monitor the environment, to take measures to reduce the impact of these enterprises and to teach others to save the world.

Introduction. Training in universities and colleges conducted by the State educational standards and model curriculum of professional education in the field of Environmental Science.

Currently in Kazakhstan, training in higher education in this area is carried out on the specialties 5B060800 – Ecology (undergraduate), 6M060800 – Ecology (Master) and 6D060800 – Ecology (PhD). At the same time, Kazakh schools still do not have a course on the Environment. In Kh. Dosmukhamedov Atyrau State University training in the field of environmental work in the field are 5B060800 – Ecology (undergraduate) and 6M060800 – Ecology (Master). Education of students in these specialties is conducted in accordance with the state standard of education of the Republic of Kazakhstan.

The higher education institutions in England also train specialists in the field of environmental protection.

Aims. While universities are the leading educational, scientific, methodological and cultural centers, the training includes the study of the foundations of higher education. The main principles for the development of higher education are an important element in determining the priorities of the formation of higher education. One of these directions – is the development of conceptual and legal framework, the regulatory framework. Next – is planning education. Planning of training programs for professionals in the field of environmental education differs according to the same environmental conditions, which is typical of the region where the training is conducted.

The study aims to examine and compare the curricula of training in the field of Environmental Science of Kazakhstan (for example BSc 5B060800 – Ecology in Kh. Dosmukhamedov Atyrau State University) and England (for example, BSc (Hons) Environmental Science at the University of Northampton). The differences in the training of specialists in the field of practical studies is of interest in both countries, due to the fact that their inclusion will help to further consider them in sub-

sequent planning. In this case, special attention will be paid to how the list of disciplines, the volume of received knowledge and forms of training are used in higher education institutions in these countries.

Methods. The methodological approach of this study is focused on the study plan of the specialty with the consideration of the plan and the list of subjects in accordance with the amount of funding planned for each discipline/module, as well as the methodological basis for each of these disciplines/modules from universities (Kh. Dosmukhamedov Atyrau State University and the University of Northampton).

In addition to this there was a comparative analysis of training programs at two universities on the research discipline/module, the number of credits of these disciplines (modules), programs, and the main differences in the training of subjects in the field of Environmental protection.

Results. Study of training plans for the specialty show major differences. First of all it would be desirable to note distinctions on the number of credits in each University. Over the entire period of study the student should achieve the 129 credits in all subjects, 8–10 credits of educational and industrial practices, and 3 state final certification of the credits, a total of 140–142 credits. While studying of the Award Map of various subjects of a bachelor degree of university of Northampton showed that for the entire period of training students have to master 360 credits for 3 years of training, that is on 120 credits in a year. In total for 3 years they study 18 modules, on 6 modules in a year. Thus each module consists of 20–40 credits. The quantity of the credits for the module is established by establishes each university independently and it can vary from 10 to 60 credits. The number of credits is based on the estimated notional learning hours (where one credit represents 10 notional hours of learning). If this is compared to the European Credit Transfer and Accumulation System (ECTS) you can see that his Bachelor's degrees with honours in England, Wales and Northern Ireland, with a typical total volume of at least 360 credits, equate to 180 ECTS credits [1], because the first cycle qualifications in the Bologna Framework typically include 180–240 credits. In everyday practice, two UK credits are equivalent to one ECTS credit [2].

In Atyrau state university each credit consists of 15 credit hours of classes (1 hour per week), 15 hours of independent work of students with a teacher (1 hour per week) and 15 hours of independent work of students (1 hour per week), a total of 45 hours [3]. For classroom training includes lectures, practical and laboratory classes. In this case, the curriculum specifies how many hours allotted for each type of classroom. In just one academic year students master 36–39 credits or 1620–1755 hours, including 540–585 hours classroom teaching. In the University of Northampton 1 credit takes 10 hours, thus 200 hours are planned for one module, from them 102 hours for independent study, tutorial preparation and skills development, and other hours are

planned by the teacher taking into account specifics of specialty. That is, it is 92 hours on one module and it is 552 hours per year or 1656 hours of training over three years. Thus the number of classroom hours per year at two universities about the same (540–585 in Kazakhstan and 552 hours in England respectively).

Thus in the University of Northampton for each type of work takes a certain number of hours according to the specification program is, so 24 hours for lectures, 24 hours for working through the Module learning Material and associated activities, 8 hours for Practicals, and 24 hours for Practicals and Field visit modules, 10 hours for Practical reports (if it is equal 1000 words) and 25 hours (if equally in 3000 words), etc. Classes are given only once a week and the teacher in the module specifies the occupation type for every week with the indication of the day and time. Whereas in universities of Kazakhstan the number of hours of classes indicated in the curriculum according to the standard plan for the compulsory modules and in the curriculum for the designated components and the tutor cannot itself select and change them. Each module is studied during two semester, each of semester consists of 13 weeks, within only 26 weeks. And in Kazakhstan each module is studied for only one semester, which consists of 15 weeks of training [3].

If we examine what modules are taught in Atyrau State University and at the University of Northampton in similar in value to degrees, you will see big differences. In all disciplines/modules are divided into three groups: general education, basic and specialized module. The majority of general educational disciplines/modules are studied in the first year, only a fraction of those in the second year of study. Whereas at universities of England there is no such division. First of all it would be desirable to pay attention to the fact that the course BSc in Kazakhstan is four years, which is a consequence of the fact that the list of disciplines/modules includes general module that are not taught in universities in England. The number of credits for general educational modules comprise from 2 to 6, a total of 33 credits. In addition, students learn basic and undergraduate majors. They are divided into compulsory components and optional components [3]. Compulsory components of basic module according to the standard chart of account for 20 credits and include seven modules: Professional Kazakh language, Professionally – Oriented Foreign Language, Environmental Aspects of Natural History, Biogeochemistry and Ecotoxicology, Geoecology, Environmental resource maintaining, The Origin and Evolution of the Biosphere. Compulsory components of main subjects according to the standard chart of account for 5 credits, and include two modules: Fundamentals of System Ecology, Environmental Monitoring. Besides the basic and main modules consist of the components of designated, which according to the standard chart of account for

44 and 27 credits, respectively. The list of modules each institution defines itself according to the region where it is located.

The environmental situation in Atyrau region is influenced by climatic and anthropogenic factors, the most important of which are the Caspian Sea level rise and the rapid development of the oil and gas industries. Therefore, for the specialty BSc 5B060800 – Ecology in Kh. Dosmukhamedov Atyrau State University according to State educational standard identified the following educational programs: Applied Ecology; Environmental inspection and monitoring of the environment; Management in ecological education. Each type of educational program consists of a list of relevant modules, some of which are common to all three programs, only 16 basic modules and 9 main, including 11 basic modules and 6 main overall. For the educational program «Applied Ecology» typical modules such as: «Scientific basis for land management and cadastre», «Methods of disposal of domestic and industrial waste» etc. For the educational program «Environmental Inspection and control of the environment» characterized by such modules as: «Evaluation of environmental security», «Ecology of aquatic ecosystems», etc. For the educational program «Management of environmental education» of the typical modules such as: «Pedagogy», «Methods of teaching Ecology and Geography», «Psychology» etc.

We also examined specialty Award Map at the University of Northampton, which are prepared according to the Subject benchmark statements and map in environmental science at the University of Northampton has been drawn up on the basis of the «Earth sciences, environmental sciences and environmental studies 2007» [4]. Having considered the Award Map of BSc (Hons) of Environmental Science of University of Northampton we see that students are trained according to four programs: Environmental Science, Environmental Science (Climate change), Environmental Science (Landscape Ecology) and Environmental Science (Waste). Thus on the first year of training students study 6 compulsory modules: Air and Water – Principles; Introduction to ecology; Wastes as an Environmental Issue; Principles of Physical Geography; Fundamentals of Environmental Science; Biodiversity: An Introduction. On the second year of study 3 modules compulsory for all being trained programs: Research Methods; Environmental Law; Air and Water – Processes. On the third year of study only the «Research Project and Dissertation» module with 40 credits is compulsory for all programs.

List of study programmes and modules of specialties 5B060800-ecology and BSc (Hons) Environmental Science University showed that two different ways, depending on the needs of the region, which has been training specialists. The University of Northampton is more attention to climate change issues and concerns, as well as waste processing infrastructure is well developed. Whereas, Atyrau is

the oil region is characterized by poor environmental condition and in need of frames that can give a correct assessment of the environment, solve practical problems of environment and teach others to apply carefully to the environment.

Conclusions. At the moment educational institutions are faced with a problem of detection and the analysis of results of own activity. Thus for understanding of efficiency of educational space the assessment individual and subject (relating to what – or a subject matter) and over subject abilities of trainees has the extreme importance. As a rule, basic knowledge, abilities and skills of trainees are formed to the higher education institution, however full polishing, sharpening of many skills, abilities occurs during their educational professional activity [5]. Therefore researches on studying of similar educational programs on training of specialists in the field of environmental protection at universities of two countries will help to expand our knowledge for experience use at further planning. It should be noted that there is a number of distinctions at training of specialists in the Environmental Science in England and Kazakhstan (on the example of the University of Northampton and Kh. Dosmukhamedov Atyrau State University), among them it would be desirable to note the following distinctions:

- A BSc in England takes three years, and in Kazakhstan four years. By comparing the periods of study in the universities of the two countries, we see that students studying for a bachelors degree in England don't study general education disciplines which are characteristic for Kazakhstan.

- In England each module includes from 10 to 60 credits. At the University of Northampton on the specialist BSc (Hons) «Environmental Science» modules consist from 20 to 40 credits. Whereas in Kazakhstan the quantity of the credits for each module consists of 2–6 credits. In total for the entire period of training in England students study 360 credits (on 120 credits in one year). Here practical training which is included in the corresponding modules are also included. In Kazakhstan students have to master 129 credits of the credits in all modules, 8 credits are for educational and practical modules and 3 credits are for state total certification modules, only 140 credits. That is quantity of the credits on practicals are considered separately from modules. If we translate the ratio of credits to the ECTS system it is in England 2 credits UK:1 credit ECTS, while in Kazakhstan it is inversely proportional to the ratio 1 credit RK: 1,4 credits ECTS.

- In England 1 credit makes 10 hours, in Kazakhstan 1 credit of 45 hours, but only 15 hours of classroom hours. At the University of Northampton the majority of modules consists of 20 credits that makes 200 hours, from them 102 hours plan for independent works that makes 51% whereas at the corresponding quantity of the credits, in Kazakhstan it will make 900 hours, 600 hours or 66, 67% make of them hours directed for independent work.

The number of classroom hours per year in the two countries is almost identical and is 540–585 in Kazakhstan and 552 hours in England.

- In only three years of training at the University of Northampton students of the specialty BSc (Hons) «Environmental Science» study 17 modules: on the first and second year of training on 6 modules and on the third 5 modules. At Atyrau State university on specialty 5B060600 – Ecology study 11 general education modules, 25 basic modules and 11 main modules, only 47 modules, from them 12 modules at the first year, 17 modules on the second year, 13 modules on the third and 5 modules on the fourth year. Besides there are distinctions in a choice of educational programs, as Subject benchmark statements may also be of interest to prospective students and employers, seeking information about the nature and standards of awards in a given subject or subject area. At the University of Northampton range of educational programs related to the study of Climate Change, Landscape Ecology and Management of Waste, while the choice of educational programs of Atyrau State University is directed on more local area because the region is oil-extracting and there many enterprises engaged in production, transportation and oil refining and requires professionals who have to monitor the environment, to take measures to reduce the impact of these enterprises and to teach others to save the world.

In summary, despite various approaches in training of similar specialties on a profile at the University of Northampton and Kh. Dosmukhamedov Atyrau State University, higher educational institutions are faced by an important task in receiving highly qualified specialists and data from their researches will help to make use of the experience of both universities after planning and before educational programs.

References

1. Higher education credit framework for England: guidance on academic credit arrangements in higher education in England, August 2008, available at: <http://www.qaa.ac.uk/Publications/InformationAndGuidance/Pages/Higher-education-credit-framework-for-England-guidance-on-academic-credit-arrangements-in-higher-education-in-England-Augu.aspx>.
2. ECTS Users' Guide. European Communities, 2009, available at: http://ec.europa.eu/education/lifelong-learning-policy/doc/ects/guide_en.pdf.
3. Gosudarstvennyy obschebyazatelny standart vysshego obrazovaniya, 23 August, 2012, no. 1080, available at: http://www.aipet.kz/standart/standart_bac_ru.pdf.
4. Earth sciences, environmental sciences and environmental studies, 2007, available at: <http://www.qaa.ac.uk/Publications/InformationAndGuidance/Documents/EarthSciences.pdf>.
5. Abuova A.E. Monitoring kachestva obrazovaniya kak upravlenchesko-kontroliruyushchaya deyatelnost v sisteme tselostnogo pedagogicheskogo protsesssa – Nachalnaya shkola Kazakhstan, 2007, no. 5. pp. 35–36.

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Short Reports

INNOVATIVE POLICY OF DEVELOPING
EDUCATION SYSTEM IN RUSSIAN
FEDERATION

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Innovative activity becomes the most efficient form of intensifying reproductive processes in terms of transformation of world economy. The level of innovative activity defines temper of economic growth, competitiveness, social development and ecological situation at the level of separate enterprises, sectors, and economy as a whole. Innovative processes make it possible to overcome recourse crisis via transiting economy to a new level of quality, thus providing for solving a triple problem that is written down within the concept of stable development – unity of social, ecological, and economic goals.

Providing for correspondence between an educational system and demands of presence is possible according to the universal principle of development that realizes through new ideas on the developing world and usage of information in management. Innovative policy of educational area becomes its tool of managing development. In this case innovative activity of different subjects of education serves as a tool of management.

A system of measures and direction of a state's acts that aim for creating a complex mechanism of supporting innovative activity in field of education, increasing competitiveness of Russian education system through the system of institutional alterations, developing and improving regulative basis, and developing infrastructure of innovative process in educational system is defined as innovative policy [1].

Innovative policy has its *strategic and tactical aspects*. Tactics and strategy are different temporal horizons, therefore, their goals and methods aren't equal in their scale. Innovative strategy is a long-term programme, it is oriented towards long-term perspective. It can be defined specifically as a system of conceptual settings that emerge from long-term goals that define a nature of distributing recourses between trajectories of innovative development of education system, and also their re-distribution in case internal or external conditions of its functioning alter. Innovative tactics pursues closest problems of a given period. Tactics is correction of strategic course that considers modern situation. Strategy and tactics exist in dialectic dependence, however, the former is more stable [3].

Developing and realizing innovative policy within the system of education is provided by a cumulative subject of managing education development. It is important to create cumulative subjects

of managing implementation of development strategy in order to develop and implement regulative documents of innovative policy: group (creative groups, methodic unions, teams of professionals); collective (pedagogic union of an education system, professional-managing unions); corporative (educational institutions, training organizations); integrative (scientific-managing and social-pedagogic unions); network (totality of people that is formed according to communications in global informative or social training networks) [4].

Efficiency of an innovative policy of developing educational sector is mainly defined by a degree of widening dialectic conflicts between function and development. Innovations are not only factors of development, but also are factors of transforming conditions of an educational system's function. Being introduced into the tissue of functioning, innovations provide for the very development.

Dialectic unity of processes of functioning and development of an educational system serves as a significant methodologic foundation of forming and realizing innovative policy of developing educational sector.

Education system represents a complex of sub-systems: pedagogy, in which educational process is implemented; economy, in which financial-economic mechanisms operate; society in which its participants – people, their groups and unions initiate social relations between each other and with environment; organization, in which efficiency of managing educational system is provided, and confirmation of pedagogic, economic, and social aspect of its activity takes place [2]. Therefore, in order to define managing mechanisms of its development, one should outline corresponding innovative processes within these sub-systems (pedagogic, economic, social-pedagogic innovations, organization-management and innovative processes within educational system) and consider their specific features.

Nowadays innovative policy is a component of state social-economic policy in developed countries. State regulation of innovative processes within economic, technologic, cultural, military, social, and educational areas should provide for their system development.

References

1. Y.I. Nikonova Innovative policy with in national economy state regulation system: monograph / Y.I. Nikonova; ed. by A.G. Ivasenko, Novosibirsk, Ed. office of Novosibirsk state technical university, 2010.
2. Novikov D.A. Introduction into the theory of managing educational systems. / D.A. Novikov. – Moscow, Egves, 2009. – 156 p.
3. Nikonova Y.I. Contents, essence, and basic principles of forming innovative policy of developing economic systems // Fundamental research. – 2011. – № 8.
4. Kolesnikova I.A. Pedagogic praxeology: textbook for students of higher pedagogic educational institutions / I.A. Kolesnikova, E.V. Titova. – Moscow, Ed. center «Academy», 2005. – P. 47–58.

STUDYING AND DISCHARGING CULTURES OF LACTIC ACID BACTERIAS, YEASTS FROM NATURAL FERMENTS TO PREPARE LOUMISS ON GOAT MILK

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This article describes microflora of koumiss, prepared from goat milk and horse milk. Strains of the following lactic acid bacteria have been outlined: 3 aerobic 1S; 2S; 3S; 4 anaerobic – 4S; 5S; 6S; 7S; 2 cultures of yeasts – 1Sy, 2Sy. These cultures have been studied for morphologic, physiologic, cultural, and antagonistic characteristics for *Bacillus mezentericus*, acid-producing activity on horse milk has been established. Ferment for receiving koumiss from lactic acid bacteria and yeasts in relation 1:1 has been composed (*Bacillus*, *Coccus*, yeasts). Cultures that increase collections of microorganisms have been selected in order to be used as ferments.

Keywords: starting cultures, mesophilic lactic acid bacteria, *Bacillus mezentericus*

Humanity has been using milk over 6 thousand years, and cultured milk beverages occupy a special place in human life. Since ancient times people have used goat, cow, horse, camel milk.

Most cultured milk products contain processes of mixed fermentation – lactic acid and spirituous.

Nomadic nations (Kazaks, Mongol, Kirghiz, Bashkir, Tatar) have been producing koumiss from horse milk since ancientry. It had different names among some nations: for example, koumiss was called «al-laban-arram-aki» among Arab nations, and the Turkic called it «koumissom».

Koumiss is a cultured milk beverage that is fermented on horse milk and consists of lactic acid bacteria and yeasts. Methods of preparing koumiss have been known by ancient Scythians. In the V century B.C.E. Herodotus wrote: «the Scythians prepare koumiss from horse milk». The Scythians fermented horse milk in wooden vessels. According to Herodotus, the Scythians kept the secret of making koumiss. The first written mention on preparing koumiss, its taste and its effect upon an organism emerged in 1253 after Wilhelm Rubrikos's journey to lands of Tatar. According to some historians, koumiss's motherland is Asia, specifically its steppe part. It is considered that koumiss has been first prepared in Mongolia. We would also like to outline koumiss's significance as a medical agent that has been used since ancient times. The Kazakhs boiled kazy (horse sausage) in koumiss to treat catarrhal diseases. Koumiss with raisins was prepared for the older people and children.

Technologies of making koumiss bear urgency nowadays as they use industrial and domestic methods (facilitation of clean cultures, or stable fermenting, and using natural fermenting). This technology has a number of its advantages and disadvantages. These are: acidity, organoleptic indexes, consistency, and

antagonistic activity. These cultures are necessary objects as they are starting cultures in producing koumiss.

The goal of this work is to prepare koumiss from goat milk, study and outline strains of mesophilic anaerobic and aerobic lactic acid bacteria and yeasts, grown under $t = 37^{\circ}\text{C}$, define antagonistic characteristics while discharging cultures of lactic acid bacteria and yeasts.

Samples of 2 different types of milk served as the research object: goat and horse milk of morning milking, prepared in Ganyushkino village of Kurmangazinsk district of Atyrau region. Organoleptic characteristics of these samples (taste, smell, consistency, acidity according to Turner) have been proved to correspond to GOSTs.

Several objectives have been set in order to achieve the goal:

1. Ferment samples of horse milk to prepare koumiss (in domestic conditions).

2. Use the received koumiss for further fermenting of goat milk.

3. Discharge lactic acid bacteria and yeasts from the natural ferment via separation method.

4. Study and define morphologic, physiologic characteristics of these anaerobic and aerobic lactic acid bacteria and yeasts.

5. Use method of separation and sowing into liquid environment in order to receive clean cultures.

6. Define acid-forming activity according to Turner.

7. Receive koumiss from goat milk and use it as natural ferment to prepare koumiss from horse milk.

8. Define antagonistic characteristics of the discharged lactic acid bacteria and yeasts via lunula method in relation to strain *Bacillus mezentericus*.

9. Make a composition using cultures of lactic acid bacteria and yeasts.

The mixed products, presented from natural ferment of the prepared horse milk koumiss (50 ml of koumiss + 50 ml of goat milk) have been placed into thermostat for 24 hours under the temperature of 37°C. Acidity according to Turner equaled 32°T for the received one-day cultures milk products of mixed type, their consistency and smell – friable clot with the smell of horse milk. Cultures of lactic acid bacteria have been discharged in a dense environment of Bogdanov under $t = 37^{\circ}\text{C}$, and yeasts have been discharged in a dense nutritious environment (Sabura). Growth of lactic acid bacteria has been defined according to emergence of colonies, grown on the nutritious environment. 9 cultures of lactic acid bacteria have been discharged from ferment on goat milk, among those: 3 aerobic strains, 4 anaerobic strains, 2 strains of yeasts. All strains have been grown in liquid environments: cultures of lactic acid bacteria have been sowed into hydrolized milk, 2 cultures of yeasts and peptone have been sowed into yeasts environment with glucose.

All cultures have been inspected for catalase, and been established as catalase-negative, unable to produce catalase. Morphology of all strains has been studied according to the method of Gram. The following cultures have been established according to morphological characteristics: 3 cultures of coccus (1S; 3S; 6S), 4 cultures of bacillus (2S; 4S; 5S; 7S), among those 5 strains are – gram-positive (G+) (1S; 2S; 4S; 5S; 7S), 2 cultures are gram-negative (G-) according to Gram. We have also studied morphological features of yeasts, they have an oval shape.

We have defined antagonistic activity of the 9 outlined cultures in nutritious environment via method of lunulain relation to test culture *Bacillus mezentericus*. As a result, we have revealed an antagonistic ability to oppress growth of *Bacillus mezentericus* among the discharged cultures. The results are provided in Table 1.

Table 1 shows that maximum areas among aerobic cultures refer to 1S (11 mm), and minimal areas refer to 2S and 3S (7 mm). Maximum areas among anaerobic cultures refer to 4S (15 mm), minimal areas refer to 5S, 6S, 7S (7–11 mm).

Table 2 shows us maximum areas of growth – 6mm (2Sy) and minimal area – 5 mm (2Sy).

Acidity has been studied among the 9 discharged aerobic and anaerobic cultures and lactic acid bacteria and yeasts while sowing them on horse milk during different periods. The basic feature of lactic acid bacteria and yeasts is their ability to accumulate lactic acid. This characteristic is important for producing koumiss from the practical point of view. Dynamics of acid formation has been studied on hourly basis during the first day of growth. The data is presented in Table 3.

Table 1

Antagonistic activity of lactic acid bacteria that have been grown on milk hydrolyzate in relation to *Bacillus mezentericus*

Aerobic strains of lactic acid bacteria	Growth areas (mm)
Control	0 mm
1S (<i>Lactococcus</i>)	11 ± 0,3
2S (<i>Lactobacillus</i>)	7 ± 02
3S (<i>Lactococcus</i>)	7 ± 02
Anaerobic strains of lactic acid bacteria	Growth areas (mm)
Control	0 mm
4S (<i>Lactobacillus</i>)	15 ± 0,6
5S (<i>Lactobacillus</i>)	11 ± 0,4
6S (<i>Lactococcus</i>)	7 ± 0,2
7S (<i>Lactobacillus</i>)	11 ± 0,3

Table 2

Antagonistic activity among the discharged yeasts, grown in peptone – yeast environment with glucose in relation to *Bacillus mezentericus*

Yeasts	Growth areas (mm)
Control	0 mm
1Sy	6 ± 0,3
2Sy	5 ± 0,2

From Table 3 we can see that strains form a moderate acidity within 3 hours, among them – 1S; 2S (10–12°T); low acidity is formed by 3S (9°T). Within 24 hours these cultures differ in acidity: 1S and 2S have a higher acidity (49–48°T), 3S shows a moderate acidity (40°T).

We have used the sample of fresh horse milk under an active acidity for 4 aerobic cultures. The table shows that strains 4S and 5S form low acidity (10–12°T) within 3 hours. Moderate acidity is formed by strains 6S and 7S (13–130°T). Strains 6S and 7S have shown high acidity (55–57°T) within 24 hours. Moderate acidity was shown by strains 4S and 5S (40–45°T). All cultures have been grown on horse milk in order to define acidity level.

Table 4 shows that yeasts form low acidity within 3 hours: 1Sy, 2Sy (10–9°T). Within 25 hours these cultures begin to differ in acidity. 1Sy and 2Sy have moderate acidity (34–36°T). All yeasts have been grown on horse milk in order to define acidity level. Thus, active accumulation of acidity has been registered for culture 1Sy of lactic acid bacteria.

Table 3

Dynamics of acid formation among the discharged cultures of lactic acid bacteria during 24 hours (1 day) and 3 hours.

Aerobic strains	3 hours	acidity, °T	24 hours	acidity, °T
Control	–	–	–	–
1S Lactococcus	++	10 ± 1,4	++ +	49 ± 3,7
2S Lactobacillus	++	12 ± 2,8	++ +	48 ± 3,6
3S Lactococcus	+	9 ± 1,0	++	40 ± 3,5
Anaerobic strains	3 hours	acidity, 0T	24 hours	acidity, 0T
Control	–	–	–	–
4S Lactococcus	+	10 ± 1,4	++	40 ± 3,5
5S Lactobacillus	+	12 ± 2,8	++	45 ± 3,5
6S Lactobacillus	++	13 ± 3,0	+++	55 ± 3,8
7S Lactobacillus	++	13 ± 3,0	+++	57 ± 4,0

Table 4

Dynamics of forming acidity among the discharged yeasts

Yeasts	3 hours	Acidity, °T	24 hours	Acidity, °T
Control	–	–	–	–
1Sy	+	10 ± 1,1	++	34 ± 3,0
2Sy	+	9 ± 1,0	++	36 ± 3,1

After defining antagonistic features and acidity according to Turner, we have formed compositions from ferments, taking 2 ml of liquid nutritious environment from each culture and 8 ml of horse milk. The ferment compositions looked as follows: (1:1:1) – 5S (anaerobic culture) – bacillus, 1S (aerobic culture) – coccus, 1Sy – yeasts on horse milk. Thermostat under $t = 37^{\circ}\text{C}$ has been used to grow cultures of lactic acid bacteria and yeasts on horse milk during 24 hours.

Acidity according to Turner and organoleptic characteristics have been studied among the received one-day lactic acid products of mixed type. Acidity of the formed composition equaled 20°T . After defining acidity, all cultures, placed in 10 ml test tubes, have been mixed, and 30 ml mixture has been received. This mixture has been added to 70 ml of horse milk and then placed to thermostat under temperature of 37°C for 24 hours. Acidity according to Turner and organoleptic features have been defined once again in a day. The prepared lactic acid product had a non-thick sediment at the vessel bottom and gas bubbles on its surface. Acidity according to Turner equaled 47°T . The received 100 ml mixture has been added to 200 ml of horse milk once again. The total mass of 300 ml has been placed into thermostat under the temperature of 37°T for 2 days. Acidity according to Turner and organoleptic characteristics have been measured in 2 days once again. Acidity according to Turner equaled 110°T . This mixture has been used as a ferment in relation 1:2, lactic acid

ferment and milk correspondingly. Goat milk can be used to increase ferment mass.

Resume

1. Samples of horse and goat milk of Atyrau region, their organoleptic characteristics and acidity according to Turner have been studied.

2. 9 active cultures have been discharged from natural ferment, among those 4 anaerobic, 3 aerobic lactic acid bacteria and 2 yeast cultures.

4. Nutritious environments of Bogdanov, Sabur, milk hydrolyzate, peptone-yeast environment with glucose has been used to discharge and study cultures of lactic acid bacteria and yeasts.

5. Morphological and cultural antagonistic characteristics have been revealed and studied among these 9 discharged cultures.

6. Active strong acid formers of have been determined among lactic acid bacteria – 1S, 2S, 6S, 7S and 1 – among yeast cultures – 1Sy.

7. Composition of preparing koumiss in relation 1:2 has been composed (ferment and milk correspondingly).

References

1. Kvasnikov G.I., Nesterenko A.O. Lactic acid bacteria and ways of their facilitation. Ed. office «Nauka», Moscow, 1975, 384 p.
2. Practical training session on microbiology Ed. by A.I. Netrusov. – M.: Ed. office «Academia», 2005. – P. 145–150.
3. Cherepanova V., Khasenov A. Koumiss and Shoubat. – 1971. – 188 p.
4. Shigayeva M.K., Ospanova M.S. Microflora of national cultured beverages. – Alma-Ata: Science, 1983. – 152 p.
5. Ospanova M.S. Antibiotic characteristics of yeasts, discharged from koumiss // milk industry. – 1981. – № 10. – P. 2–28.

*Materials of Conferences***THE INVESTIGATION OF ESSENTIAL OIL OF THE THYMUS PALLASIANUS L. HERB**¹Bubenchikova V.N., ²Starchak Y.A.¹Kursk State Medical University, Kursk;²Orel State University Medical Institute, Orel,
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In Russian scientific medicine there are official plants from the *Thymus* genus: *Thymus serpyllum* L. and *Thymus vulgaris* L., which are used as expectorant means. The *Thymus vulgaris* L. grows in the Mediterranean countries. The main area of a *Thymus serpyllum* L. is the European part of Russia, but its resources are strongly exhausted. Now in the area of the Central Chernozem region the thyme is rarely spread, but along with it there grows about 7–8 close types in the territory of the specified areas: a *Thymus marschallianus* L., a *Thymus pulegioides* L., a *Thymus calcareus* L. and *Thymus pallasianus* L.

As a rule during preparation of raw materials of a thyme suppliers don't distinguish types therefore there can be other types of raw materials along with a thyme and instead of it, widespread in this region and their different combinations. However, the species of a thyme widespread in the midland of the European part of Russia belong to various sections and subsections and naturally differ by morphological features and by chemical structure, according to the contents and qualitative structure of essential oil, as one of the main classes of biologically active agents of plants of a *Thymus* genus.

The thyme herb contains essential oil which includes aromatic terpenes: thymol; cymophenol; monoterpenes, sesquiterpenes, the content of which strongly varies depending on a place of growth, a habitat, height above a sea level, phases of development of a plant, etc.

There are more than 8 chemotypes of essential oil of *Thymus* genus plants, one of them has prevailing components such as thymol and cymophenol, while the other has in α -terpyneol, the third has geraniol, etc.

Thus, it was interesting to study a qualitative and quantitative composition of essential oil of a *Thymus pallasianus* L. belonged to the flora of the Midland of Russia.

Materials and methods. The object of research was the dry crushed herb of a *Thymus pallasianus* L. collected in the period of mass flowering in 2012 in the Voronezh region (area of Liski town).

For receiving and quantitative definition of essential oil a hinge plate of dry raw materials of a *Thymus pallasianus* L. (20 g) was placed in a flask, filled in 300 ml of water, closed with a stopper with the refrigerator and the receiver and brought to boiling. Distillation time from the boiling moment is

2 hours. After cooling the volume of essential oil in the receiver was determined.

For the analysis of essential oil 0,5–5,0 g of the crushed dried-up *Thymus pallasianus* L. herb was placed into «Agilent» vial for 20 ml, added the internal standard (tridecane), at the rate of 50 mkg on a hinge plate, then added 10 ml of cleared water, fastened a cover with the refrigerator with air cooling and placed in a small sandy bath with adjustable heating and heated within 2 hours. In the process of distillation flying substances were adsorbed on an inner surface of the return refrigerator. The adsorbed substances after cooling of system washed away 3 ml of especially pure pentane into dry vial for 10 ml. The washout was concentrated by a purge (100 ml/min.) especially pure nitrogen up to the residual volume of extract 10 mkl which was completely selected with a chromatographic syringe. A further concoction of test was carried out in the syringe up to the capacity of 2 mkl.

The test input into a chromatographic column was carried out in the splitless mode, i.e. without stream division that allows to enter test without loss on division and it increases sensitivity of a chromatographic method.

The research of a component composition of essential oil was conducted with a method of a gas-liquid chromatography on the Agilent Technology 6890 N chromatograph with the mass and spectrometer detector 5973 N. Analysis conditions: the chromatographic column capillary DV-5, length of a column is 30 m, internal diameter is 0,25 mm; gas carrier – helium, speed of gas carrier is 1 ml/min.; test volume – 2 mkl, the speed of test input is 1,2 ml/min. within 0,2 minutes; temperature of the thermostat is 50°C with programming 3°/min to 220°C; temperature of the detector and evaporator of 250°C.

The components of essential oil were identified as a result of comparison of mass spectrums of the substances entering into studied essential oil, received in the course of a chromatography with library data of mass spectrums of NIST05 and WILEY 2007 with total of ranges more than 470000 in a combination with programs for AMDIS and NIST identification.

The quantitative maintenance of components was counted with the use of a method of the internal standard.

Results and discussion. At the first stage we carried out a quantitative definition of essential oil by a volume method at the basis of which distillation with water vapor lies.

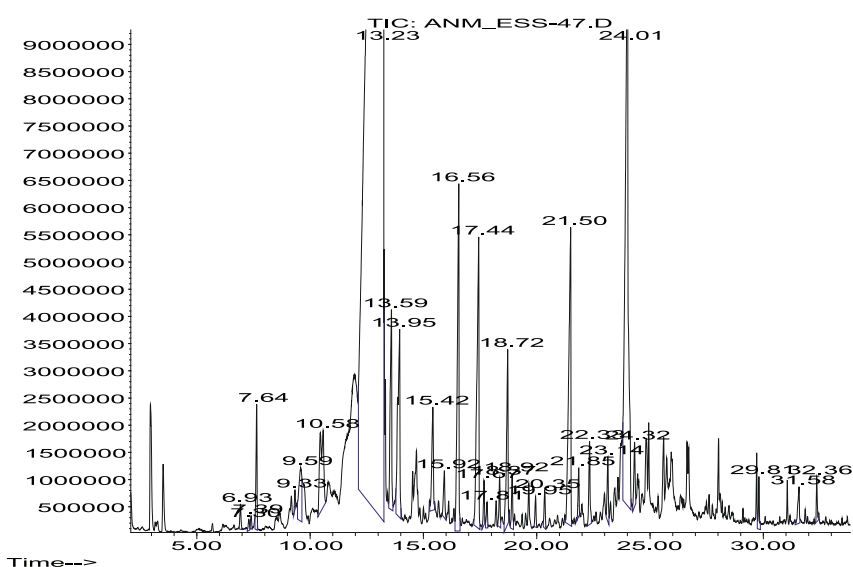
As a result it was established that the content of essential oil in a *Thymus pallasianus* L. herb fluctuates from 0,22 to 0,58%. Essential oil represents easily mobile liquid of yellowish color with a pleasant specific smell.

The analysis of essential oil of a *Thymus pallasianus* L. herb showed on the chromatogram not less than 40 substances from which 29 were identified (Figure, Table)

Composition of essential oil of a *Thymus pallasianus* L.

Number	Keeping time	Name of a Component	Maintenance of Components in samples, %
1	6,92	1,3,8-p-menthatrien	0,08
2	7,29	α -terpynen	0,04
3	7,39	p-cimen	0,04
4	7,64	Limonene	0,37
5	9,33	Terpynolen	0,05
6	9,58	Linalool	0,43
7	10,57	Camfora	0,86
8	13,23	α -terpyneol	37,56
9	13,59	Trans-carveol	0,88
10	13,95	Carvon	1,14
11	15,41	Bornylacetate	0,46
12	15,92	Thymol	0,18
13	17,44	α -terpynilacetate	1,67
14	17,67	Trans-detsenal	0,13
15	17,80	Nerilacetate	0,08
16	18,36	Geranilacetate	0,15
17	18,71	β -burbonen	0,77
18	18,91	β -elemen	0,18
19	19,95	β -cubeben	0,09
20	20,35	β -caryophillen	0,12
21	21,50	Germakren D	1,82
22	21,85	Bicyclogermakren	0,14
23	22,33	α -farnesen	0,30
24	23,14	Burbonanol	0,22
25	24,00	Nerolydol	4,75
26	24,32	Salvial-4(14)-en-1-on	0,23
27	29,81	Hechsahydrofarnesilacetone	0,14
28	31,57	Palmitic acid	0,16
29	32,35	Farnesol	0,12

Abundance



The scheme of chromatogram chromato-mass and spectral analysis of essential oil of a *Thymus pallasianus* L. herb

The dominating component of the studied essential oil is α -terpyneol, its content makes 37,56%, and also nerolydol (4,75%) against a small quantity of thymol (0,18%) and absence of cymophenol.

Thus, essential oil of a *Thymus pallasianus* L. herb of flora of the Midland of Russia was investigated. The maintenance of connections of thymol typical of a *Thymus* genus in studied essential oil is insignificant (0,18%). The main components of oil are α -terpyneol (37,56%) and nerolydol (4,75%). As a result it is possible to claim that the studied sample of essential oil of a *Thymus pallasianus* L. belongs to a chemotype terpyneol. There were 29 connections identified, basic of which are α -terpyneol (37,56%), and nerolydol (4,75%).

References

1. State Pharmacopoeia of the USSR. 11th ed. Ext. Is. 1. – M., 1987. – 336 p.
2. State Pharmacopoeia of the USSR. 11th ed. Ext. Is. 2. – M., 1990. – 400 p.
3. Banaeva Yu.A., Pokrovski L.M., Tkachev A.V. Chemistry of plant raw materials. – 1999. – № 3. – P. 41–48.
4. Chernogorod L.B., Vinogradov B.A. Plant Resources. – 2006. – Vol. 2, Is. 42. – P. 61–68.

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DEVELOPMENT OF METHODOLOGY FOR THE QUANTITATIVE DETERMINATION OF TANNINS IN THE GERANIUM SIBIRICUM L. HERB

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In the flora of the middle belt of the European part of Russia there are 17 species of the *Geranium* genus, among which the most common are the *Geranium pratense* L., *Geranium sanguineum* L., *Geranium sylvaticum* L., *Geranium palustre* L. and *Geranium sibiricum* L. [3, 6, 11]. The chemical composition of these species contains phenolic compounds, terpenes polysaccharides. Among the phenolic compounds can be identified phenol carboxylic acids, flavonoids, tannins [8, 9].

Plants of the *Geranium* genus is widely used in traditional medicine as an astringent, anti-inflammatory, hemostatic agents [9]. These types of activity are specific for tannins [8] and apparently cause the pharmacological action of the genus *Geranium*. From this point of view it would be acute to study tannin plants of the genus *Geranium* flora of the central European part of Russia.

The research problem was to develop a method for quantitation of tannins in the *Geranium sibiricum* L. herb and demonstration of its benefits.

The object of the study was a herb *Geranium sibiricum* (*Geranium sibiricum* L.), harvested in the Kursk region in 2011–2012. during the period of mass flowering plants.

Research methods. For a qualitative determination of tannins the reaction with iron – ammonium alum, bromine water, formaldehyde and hydrochloric acid were carried out to identify their origin [4].

Over 100 different methods are used for quantitation of tannins, which are divided into several groups: gravimetric, which are based on the precipitation of tannins by gelatin, hide powder, salts of heavy metals; titrimetric, which are based on oxidative reaction with potassium permanganate, iodine; photocolometric, which are based on reactions with iron salts, phosphotungstic acid, spectrophotometric [5]. For quantitation of tannins there were also used pharmacopoeia – permanganometric and complexometric and spectrophotometric methods of analysis [1, 2, 8].

Pharmacopoeia titrimetric method is based on the ability of tannins to be oxidized with a potassium permanganate [1]. However, this method has several disadvantages: the accuracy of the results depends on the clearing coefficient, which is different for different groups of tannins and plants, the ability to oxidize potassium permanganate and other natural compounds, which belongs to different classes of biologically active substances in chemical structure, and a number of others – prolixity of the color while titration, extent of dilution of titrated solutions, etc. Accordingly, the method does not allow objective evaluating of the content of tannins in the medicinal plant material, particularly if there are less than 10% of them, because the inaccuracy vastly increased due to related substances.

The spectrophotometric determination of tannins is based on the method of determination of them in the aboveground part of the marsh cinquefoil [10]. Calculation of the content of tannins was based on tannin as we have determined that the dominant group is hydrolyzed tannins, as well as while the study of the absorption spectra of alcohol – water extract of *Geranium sibiricum* L. herb and tannin solutions with 70% ethyl alcohol is established that they are the same and at a wavelength of 280 nm.

To develop a methodology for quantitation of tannins in the *Geranium sibiricum* L. herb we used a complexometric method proposed for the determination of tannin in the leaves of sumac and smoke tree [2]. A complexometric method is based on the ability of tannins to be precipitated by salts of heavy metals. The method is in precipitation of tannins of zinc with ammonia solution, isolating the precipitate, centrifugation, destruction of complex zinc – tannin by acid with following titration of precipitated zinc cations by solution of Trilon B in the presence of indicator – xylene orange [2].

Research results For the detection of tannins an aqueous extract of the herb *Geranium sibiricum*

in a ratio of 1:10 was made. While addition of a 2 ml of the extract solution 1 % ferric alum dark appearance – blue staining was seen, which indicates that researched materials contain tannins of principally hydrolyzable group. In addition to extracting of the mixture of formaldehyde and hydrochloric acid, the small precipitate of condensed tannins forms, and there are hydrolysable tannins in the filtrate, which are detected by the iron – ammonium alum, which indicates that hydrolysable tannins are predominant group in the *Geranium sibiricum* L. herb [5].

Determination of optimal conditions for development of quantification techniques tannins was carried out by using a single sample of material.

In the first phase extraction conditions of tannins have been studied: the extent of grinding of raw materials, the extraction time, type of solvent, the ratio of raw materials – the solvent. The grinding of raw materials influence the process of extraction. [7]. The study of grinding of raw materials showed that the maximum extraction of tannins is achieved with the extent of grinding 1 mm (Table 1).

Effect of extraction conditions on the content of tannins

Table 1

Extraction conditions	Content of tannins, %		
	permanganometric methods	complexometric methods	spectrophotometric methods
the extent of grinding of raw materials, mm			
1,0	21,25	11,08	5,32
2,0	18,15	8,95	4,55
3,0	18,15	10,85	4,51
extractant: purified water ethyl alcohol, %			
30	16,25	10,89	4,78
40	20,55	12,98	5,40
50	21,25	11,08	5,32
70	22,90	13,20	6,00
	20,80	10,90	5,20
Extraction time, min			
20	18,51	11,09	4,89
30	20,14	12,12	5,92
45	22,63	13,34	6,02
60	22,39	13,13	5,94

According to State Pharmacopoeia XI [1] publishing as extractant for the quantitation of tannins boiling distilled water is used, however, in the literature there is evidence, tannins are extracted by 40–50% ethyl alcohol better [1]. Our studies have shown, that the maximum extraction of tannins from the *Geranium sibiricum* L. herb is achieved by using 50% ethyl alcohol (Table 1). Therefore, we used 50% ethyl alcohol as extractant. To extract tannins we used extraction before equilibrium, which in this case occurs within 45 minutes (Table 1) when the ratio of raw materials and solvent is 2:250.

Thus, were chosen the extraction conditions of tannins from raw *geranium sibiricum*: about 2,0 grams (accurately weighed) herb *geranium sibiricum* milled to a particle size of 1 mm were placed in a flask with ground glass with a capacity of 500 ml, is filled with 250,0 ml of 50% ethyl alcohol. The flask was weighed to an accuracy of $\pm 0,01$ g, attached to a reflux condenser and heated in a boiling water bath within 45 minutes, shaking periodically to flush content from the walls of the feed particles. Then the flask was cooled to room temperature, weighed, and if necessary adjusted to the initial weight of 50% ethyl alcohol. The resulting extract was filtered through filter paper, discarding the first 10,0 ml of the filtrate.

Further extraction was used for the determination of tannins in three ways: permanganometric, spectrophotometric and complexometric.

During the complexometric determination of tannins in *Geranium sibiricum* L. raw material it was found out, that washing of the precipitate zinc – tannins with 0,25% ammonia solution does not provide a full release from the zinc ions. This is proved by repeated washing of the precipitate 96% ethyl alcohol and the formation of the red – violet color when adding to a mixture consisting of 10,0 ml of acetate buffer, 100,0 ml of purified water and 10,0 ml of xylene – orange. Thereby, the formed complex zinc- tannins, except washing 0,25% ammonia solution, was washed with 20,0 ml of 96% ethyl alcohol.

For complexometric determination of tannins 10,0 ml of obtained extract was placed in a tube for centrifugation with a capacity of 50,0 ml, then 10,0 ml of precipitation reagent (solution 1% zinc oxide in an ammonia buffer solution) was added, and the mixture was stirred with a glass rod. The rod was washed with 5,0 ml of purified water, which was added to the main mixture. After 30 minutes the mixture was centrifuged for 10 minutes at a rotation speed of 5–6 thousand revolutions per minute. The liquid was decanted from the precipitate, the

precipitate in the tube was suspended in 20,0 ml of 0,25 % ammonia solution, added to the centrifuged mixture. After 10 minutes centrifugation, the washing liquid was decanted and discarded. The precipitate was washed with 20,0 ml of 96 % ethyl alcohol and centrifuged for 10 minutes. The washing liquid was decanted and discarded, and the precipitate was dissolved in 3,0 ml of 30 % acetic acid. The resulting solution was quantitatively transferred to a 250 ml flask with 100,0 ml of purified water, the liquid was neutralized with 25,0 ml of 5 % sodium hydrogencarbonate, was added 0,5 ml of xylene and the orange solution was titrated with Trilon B 0,01 mol/l to turn red – purple color of the solution into yellow. Tannin content (X2) in percent based

on the air – dry raw material was calculated by the formula:

$$X2 = \frac{V \cdot k \cdot 0,00151 \cdot 250 \cdot 100 \cdot 100}{m \cdot 10 \cdot (100 - W)},$$

where V – volume of solution trilon B 0,01 mol/ l, consumed for the titration of the extract, ml; k – Amendment to titrate of Trilon B 0,01 mol/l, g, 0,00151 – amount of tannins, corresponding to 1 ml of the solution Trilon B 0,01 mol/l, r; m – mass of raw material, g, 250 – total recovery ml, 10 – the volume of extract, taken for titration, mL; W – humidity, %.

Two batches of *Geranium sibiricum* L. raw material were analyzed with proposed methods. The results of quantification of tannin is shown in Table 2.

Table 2

The content of tannins in the *Geranium sibiricum* L. herb (n = 5, P = 95 %)

Place and time of procurement of raw materials	Metrological characterization of methods				
	$X, \%$	S^2	S_x	E_α	$E_{\text{отн}}$
<i>Spectrophotometric method</i>					
Kursk region, 2012.	5,9	0,00625	0,07906	0,22	3,73
Orel region, 2013.	7,02	0,00485	0,06964	0,19	2,71
<i>Permanganometric method</i>					
Kursk region, 2012.	22,9	0,1	0,31623	0,88	3,88
Orel region, 2013.	29,63	0,23413	0,48387	1,35	4,56
<i>Complexometric method</i>					
Kursk region, 2012.	13,1	0,025	0,15811	0,44	3,36
Orel region, 2013.	15,34	0,02308	0,15192	0,42	2,74

The content of tannins, determined by different methods, showed, that the highest content of tannins was determined with a permanganometric method (17,86–29,63 %) and the lowest one was determined with a spectrophotometric method (5,7–7,02 %). Complexometric method showed increase of the content of tannins compared to spectrophotometric method that is apparently due to the fact that recalculation, according to this allocation method, based on tannin. Inaccuracy of methods for quantitation of tannins ranged from 3,88 to 4,56 % with the use of permanganometric method, from 2,71 to 3,73 % with the use of spectrophotometric determination and from 2,74 to 3,36 % with the use of complexometric method.

Conclusions: method of complexometric determination of tannins in the *Geranium sibiricum* L. herb was modified, optimal conditions for their extraction were defined. A comparative assessment of the content of tannins with the use of three methods was made. Among three proposed methods for standardization of raw materials of *Geranium sibiricum* L. herb the method of complexometric titration can be recommended as the most accurate.

References

1. State Pharmacopoeia of the USSR. 11th ed. Ext. Is. 1. – M., 1987. – 336 p.
2. GOST 28508-90 Tanning extracts of vegetable. Methods for determination. – M. Standartinform, 2006. – 15 p.

3. Illustrated to plants of Middle Russia. T. 2. Angiosperms (dicotyledons: razdelnolepnyye) / Gubanov I.A. Kiselev, K.V. Novikov V.S., Tikhomirov V.N. – M.: Association of Scientific. ed. KMC Institute of Technology. issued., 2003. – 508 p.

4. Phenolic compounds / M.N. Zaprometov. – M., 1993. – 358 p.

5. Medicinal Plants of the State Pharmacopoeia. Pharmacognosy / ed. I.A. Samylina, V.A. Severtsev. – M., 2003. – 534 p.

6. Flora of the middle belt of the European part of Russia (10th ed., Rev. and add.) / P.F. Majewski. – M.: KMK Scientific Press Ltd., 2006. – 600 p.

7. Extraction of medicinal plants / V.D. Ponomarev. – M.: Medicine, 1978. – 204 p.

8. Razarenova, K.N., Zhohova E.C. Chemistry of plant raw materials. – 2011. – № 4. – P. 187–192.

9. Plant Resources of Russia: Wild flowering plants and their component structure and biological activity. V.3. The family Fabaceae – Apiaceae / ed. A.L. Budantsev. – St.-P.; M.: KMK Scientific Press Ltd., 2010. – P. 113–120.

10. Sklyarevskaya N.V. Pharmacognostic study of the aerial parts of marsh cinquefoil (*Comarum palustre* L.), grown in the North-West of Russia: Author. dis Candidate. pharm. Science. – St.-P., 2009. – 24 p.

11. Flora of the USSR: in 30 volumes. Vol. XXVI. – M., P., Publishing House of the USSR, 1934–1964. – P. 201–204.

The work is submitted to the International Scientific Conference «Current problems of education», Greece, October, 15-24, 2013, came to the editorial office on 19.09.2013.

METHODOLOGY OF THE PROCESS OF GREENING DWELLING TERRITORIES IN INDUSTRIAL DISTRICTS OF A CITY

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A problem of green planting in terms of insufficient financing exists in small industrial towns. Therefore, greening should be carried out in the most efficient and resourceful manner in case when dwellings are placed in a direct contact with industrial zones and are exposed to a negative pollution of the environment. Also, efficient solution of the problem is required in terms of limited financing or total lack of gardening programmes. Methodology of the process of greening dwelling territories in industrial districts of a city is the suggested option.

Keywords: process of greening, dwelling territories, industrial districts

Industrial pollution of atmospheric air is one of the basic urbanization problems, and it mostly refers to small and medium monocities that are concentrated around one or several industrial enterprises. Transport pollution becomes the most important issue in big cities.

Cleaning facilities on sources, transiting industrial zones outside city borders, creation of gardening system, etc. is used to solve the problem of air quality.

City gardening system is an interrelated, equal allocation of urban plantings, defined by a formed development system that implies relations with plantings outside a city.

An area of natural landscape, preserved in a city even as a small introduction into an urbanized environment, usually creates a unique image of the city, takes part in filtering hazardous substances, etc.

Modern theory of city planning contains an idea of greening systems that pierce a city and have their prior purpose – enhance the city environment. According to this purpose, the structure of «green wedges» that unites planted territories, necessary for recreation, is considered optimal. Planted territories, including green wedges, play a part of protective areas that barrier certain parts of a city from the impact of super-urbanization.

A specific and generally unfavourable ecological situation is created in cities. Aerial pool of a city is constantly polluted by wastes of industrial production, exhaust gases, and dirt.

The degree of atmospheric pollution depends on the following natural factors: wind direction and speed, air temperature and humidity, landscape relief, and vegetative nature.

A so-called smog, or thick mist that contains a high concentration of industrial wastes, is formed in big industrial cities during still weather. Smog often causes serious diseases among the population.

Solid dust fractions in floating condition interact with water fumes that also feed the at-

mosphere, and they are substances that have a negative effect upon breath organs of a person. Temperature regime of a city and humidity of urban air are exposed to greater oscillations than on countryside territories. It often creates uncomfortable conditions for urban population, especially during especially cold or hot days.

Another negative factor in a person's urban life is city noise. Urban noise level often exceeds acceptable norms, it has an unfavourable effect on population health.

An intense growth of cities is often described by individual construction methods nowadays and, therefore, massive real estate development of urban and suburban territories with typed houses and constructions. Massive development with typed buildings often results in monotony and dreadness of architectural image of a city, thus making it significantly poorer.

One of the most significant urbanization problems of modern times is to overcome this monotony and dreadness while preserving quick industrial construction methods, thus achieving an expressed architectural image of a city.

Harmonic development of a person is impossible without a close relation with nature. Communication with nature serves as a powerful mean of upbringing the beauty, mastering legislations of life. Such interaction relieves these strains significantly, thus allowing for recovery of human organism.

The negative influence of unfavourable factors of urban life upon a person can be decreased significantly by a skillful allocation of green planting in a city.

Green plantings have an important meaning in filtering urban air from dust and gases. Dust remains on tree and bush leaves and then is washed down to ground with atmospheric fallouts. Spread or motion of dust is also kept by lawns that slow down dust that is carried by wind.

Air contains 42% less dust in summer period and 37% less dust in winter period among green plants than at open space.

Green plantings decrease concentration of hazardous gases in the air significantly. Dangerous fumes are absorbed by plants during the process of transpiration, and solid fractions of aerosols remain on tree leaves, trunks, and branches.

Significance of greening dwelling territories in a direct contact with industrial enterprises depends on terms of air pollution and presence of hazardous substances in the air.

Green planting is not carried out on a proper level in small towns due to a shortage in finance. There are often no programmes of greening, but there are programmes of removing «emergency» trees. Considering these problems, green planting should be carried out in specific, most efficient areas, and such measures will have the greatest effect in terms of limited financing. A special method of creating filtering barrier that also served as greening element, has been developed to solve this problem.

1. Revealing hazardous discharge sources in dwelling districts city.

2. Analyzing concentration of hazardous discharges in dwelling districts of a city during the previous 10 years.

3. Revealing the most hazardous discharges that have a negative effect upon a human health.

4. Analyzing population diseases during a definite period (oncological diseases mainly).

5. Measuring concentration of hazardous substances in air via sampling probe.

6. Revealing outspread area of hazardous discharges considering wind rose, formed according to the data of previous 5–7 years. Facilitating Unified Program of air pollution estimation «Ecolog», variant 3, Standard.

7. Creating 3D model of hazardous discharges outspread considering the formed wind rose.

8. Establishing (All-union normative document – 86 including SN 369-74) the distance of maximum hazardous substances' concentration and defining location of dwellings.

9. Defining the necessary forest and bush cultures to create filtering barrier (greening).

10. Creating planting scheme of the selected kinds directly in a studied district.

11. Establishing project efficiency and costs of its realization.

The city of Lesosibirsk (Krasnoyarsk region) has been selected to appraise the methodology. Dwelling territory of Lesosibirsk is located in a sanitary-protective zone (that is unacceptable according to Construction norms and rules 2.07.01-89) of industrial enterprises of hazard class I that should have a border in 1 km from an enterprise and 40% greening degree (Sanitary rules and norms 2.2.1/2.1.1.1200-03), but in fact – less than 20%. Thus, enterprises have a negative impact upon the environment and health of popula-

tion. This fact is testified by a high concentration level of hazardous substances in Lesosibirsk atmosphere. The list of one hundred most dirty cities of Russian Federation according to atmosphere pollution index puts Lesosibirsk at the 16th place in 2010 and 13th place in 2011.

An increase in initial population disease rate, high level of oncological diseases and resulting deaths is registered in Lesosibirsk. One of the factors that influence population health is exceed of an utmost acceptable concentration of hazardous substances in atmosphere and a high index of atmospheric pollution.

Degradation of air quality becomes an important ecological problem of large and industrial cities. Lesosibirsk is a center of Krasnoyarsk region wood industry, numerous wood processing plants are located there: JSC «Lesosibirskiy wood industrial complex № 1», CJSC «Novoyeniseyevskiy wood and pine industrial complex», JSC «Maklakovskiy wood industrial complex». Production of timber, wood fiber plates, and items of wood is linked to complex technological processes that result in atmospheric pollution. A number of boiler houses, placed within city borders also contribute to air pollution. *Presence of such stationary sources of waste increases contents of phenols, formaldehydes, benzo[def]phenanthrene, carbon oxide, weighed substances, etc. These substances have a proved negative effect of population health. Picture 1 represents the data according on initial disease rate in Lesosibirsk.*

According to the report collection «Condition of environmental objects' pollution at the territory of Krasnoyarsk region, republic Khakasiya and Tyva» major sources of atmospheric pollution in Lesosibirsk are JSC «Lesosibirskiy wood industrial complex № 1», CJSC «Novoyeniseyevskiy wood and pine industrial complex», JSC «Maklakovskiy wood industrial complex». Studying stationary pollution sources, we outline heat station HS-1 in the workshop of Wood fiber plates JSC «Lesosibirskiy wood industrial complex № 1», as they are located in a direct contact with dwelling territories. Wood splinter is used as fuel at HS-1, and total discharge of volatile substances equal 85%, while this index equals 58% for coal. Wood splinter has a lower heat output coefficient than coal, and, therefore, a greater mass of splinter is used, so the volume of volatiles is increased.

We have calculated the areal of hazardous discharges outspread considering wind rose according to the data of the previous 7 years, the data is provided in Fig. 2.

The received data proves that dwelling houses of microdistrict № 7 are located in areal of pollution.

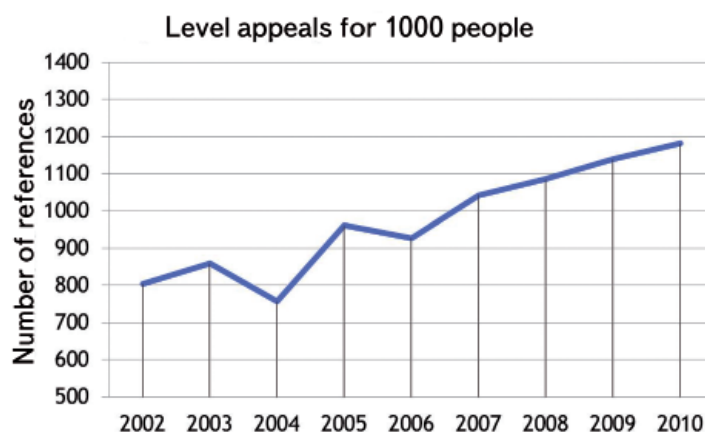


Fig. 1

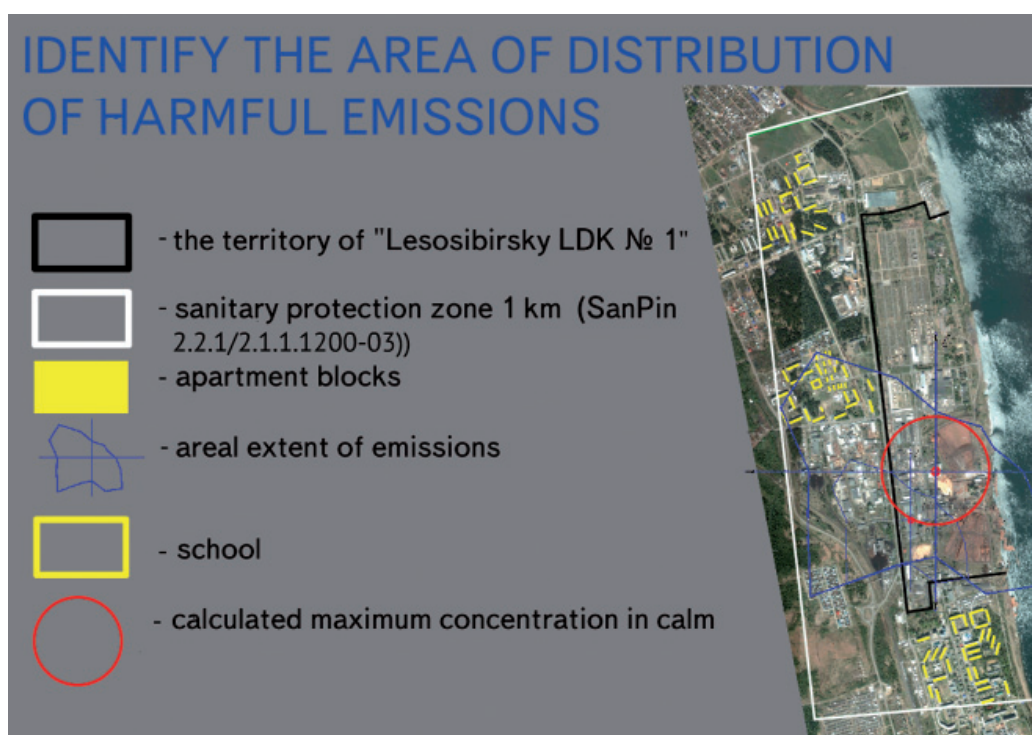


Fig. 2

According to sanitary norm SN 369-74, we have carried out calculations of maximum concentration range, it equals 663 meters. The estimations are carried out for heat station HS-1 according to All-union normative document – 86, issued instead of SN 369-74, the results are provided in Fig. 3.

As Fig. 3 shows, dwelling houses of micro-district 7 are located in the area of graduate decrease in pollution level, therefore, it is necessary to create a filtering barrier that will protect houses from the remaining hazardous substances.

Using the Unified Program of air pollution estimation «Ecology», variant 3, we have carried out calculations of hazardous substances in the atmosphere of Lesosibirsk that are included into Index of atmospheric pollution – phenols, formaldehydes, benzo[def]phenanthrene, carbon oxide, weighed substances. Calculations in the programme are carried out according to the data on sources of pollution during the period winter-summer. The received data testifies the calculated distances of maximum concentration.

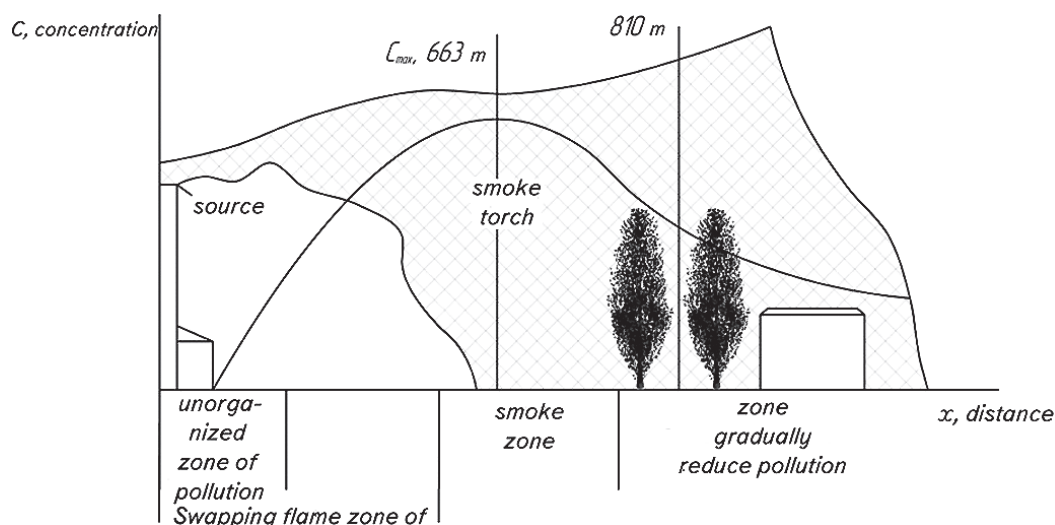


Fig. 3

We have considered researches on green plantings while studying specific kinds and cultures. Below are provided researches by botanic department of Kemerovo state university on investigating plants' stability in conditions of industrial grounds and dwelling districts of Kemerovo.

Table 1

Gas absorbing ability of plants
(grams per 5 kgs of raw green mass)

Plants	SO ₂	NO ₂	NH ₃
Balsam poplar	30	23	13
Common birch	25	25	5
Tillet	28	20	3
Rock maple	13	8	2
Lawn grass	105	65	60
Bushes	75	60	50

Our attention has also been drawn to researches by doctor of biology Yuriy Zakharovich Kulagin, head of forest study laboratory (1971–1983) of the Institute of biology in Ufa [2].

After studying normative documents on green planting, we have selected several cold-resistant kinds that grow well within the borders of Lesosibirsk and also added Laurel-leaved poplar (with no fluff), bred by Siberian institute of physiology and biochemistry of plants. It doesn't produce fluff (unseasoned aglets fall off) and holds a leaf 1–1,5 months longer (as a leaf is the main barrier for hazard-

ous substances, a tree can absorb more fumes throughout the year) [1].

Table 2

Gas absorbing ability of Siberian poplar

Pollution type	Per one day	During vegetative period
SO ₂	20 mg	130–180 g
NO ₂	12 mg	80–120 g
NH ₃	8 mg	50–80 g
Phenol	0,3 mg	2–3 g
Dust (weighed substances)	7-8 mg	50 kg

Our search stops at Laurel-leaved poplar (with no fluff) as it grows rapidly, has a high gas absorbing ability, isn't pretentious to soil and other conditions, doesn't have negative attributes of poplars that grow in Enisey district (fluff, chamaemyid disease). We shall add 10% of pine into its natural composition as pines produce phytoncides and other substances that provide for healing lung diseases. Apart from that, common pine is one of the leaders in noise absorption among trees.

Fig. 4 shows the part of microdistrict-7 on which we suggest creation of filtering barrier.

In conclusion we would like to outline the efficiency of this methodology. It is defined by the fact we can select the most efficient place for green planting and the best kind to create filtering barrier.

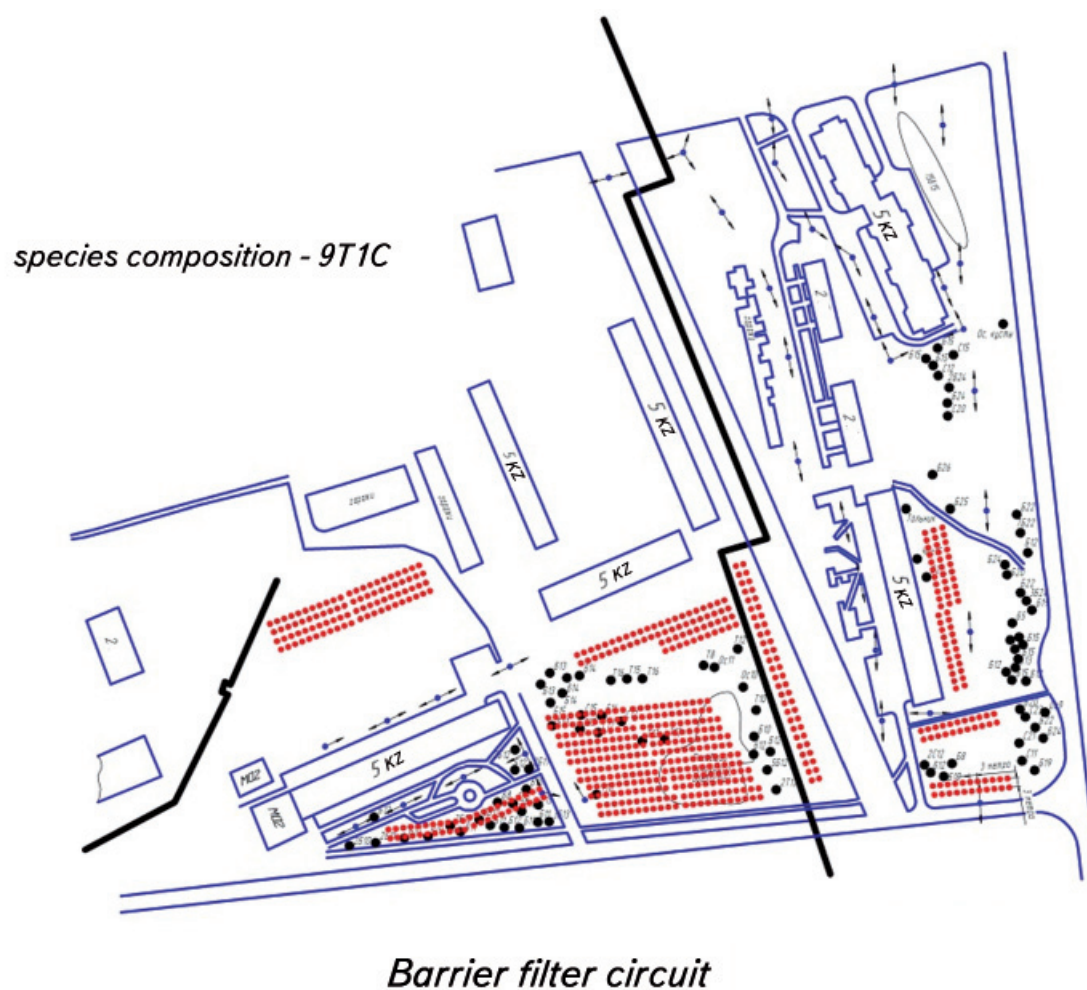


Fig. 4

Table 3

Comparison of cold-resistant kinds of green planting

Name of tree	Gas resistance	Tree height (m)	Nurseling height (m)	Height in 10 years after planting (m)	Nurseling price, rubles
Laurel-leaved poplar (with no fluff)	+	30–35	1,5	10 and over	1000
Common pine	–	20–40	1,5	up to 5	250
Rowan tree	+	10–15	1,0	up to 5	150
Balsam poplar	+	30–35	1,0	10 and over	200
Weeping birch	–	25	1,0	up to 5	150
Siberian spruce	–	30–45	1,0	up to 2	250

References

1. Shaposhnikov A.P. The part of green plantings in fighting industrial discharges / A.P. Shaposhnikov, N.V. Bobokhydze //

Works of of the institute of Novocherkassk engineering-amelioration institute. – 1977. – № 3.

2. Kulagin Y.Z. Gas resistance // Forest encyclopedia. – M.: Soviet encyclopedia, 1985. – Vol. 1. – P. 182.

PREVENTION OF PROFESSIONAL IN STUDENTS

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The study involved 368 first year students and 376 fourth year students of the Orenburg State University, of which 416 were male and 328 were female. The study used a questionnaire «Work-Related Behavior and Experience Patterns» (AVEM) developed by Schaarschmidt W. and A. Fisher at the Institute of Psychology University of Potsdam and adapted under the guidance of T.I. Ronginskaya. None of the students had parameters with extremely high or extremely low values. High values implied active coping strategies, striving for excellence, satisfaction with life and professional claims, in both the first year students and the fourth. Type S prevailed in both male and female students (78,16 and 68,97% respectively) – thrifty, frugal, with an average level of motivation, energy costs and professional ambitions. Type A with low tolerance to frustration and stress was found in 5,75 % female students. In the fourth year, the significance of success in professional work and commitment to energy costs reflect the maturity and constructive attitude to the professional activity.

Keywords: prevention, adaptation, disorders

On the one hand, psychophysiology of professional human activity is studied by natural sciences, on the other – by such branches of psychology as labor psychology and engineering psychology. Professional psychophysiological diagnostics are most relevant for occupations that impose strict requirements on psychophysiological capabilities of a working person. In this aspect, professional psychophysiological selection and identification of professional fitness is made by comparing the properties of neural processes of a human with psychophysiological «cost» of professional activity [8].

Purpose. Prevention of stress among students. Tasks – formation of active skills for coping with stress, formulation of objectives, self-control.

Materials and methods of research

The study involved 368 first year students and 376 fourth year students of the Orenburg State University. Selection criterion for the study was voluntary factor. We have used a questionnaire «Work-Related Behavior and Experience Patterns» (AVEM) developed by Schaarschmidt U and Fischer AW at the Institute of Psychology at the University of Potsdam and adapted under the guidance of Ronginskaya T.I. Professional behavior is determined by the following three main factors:

1. Professional activity is a person's willingness to expend energy in professional work and its determining factors.
2. Strategies for dealing with problematic situations include active problem solving or avoiding.
3. Emotional mood for professional activity means a person's attitude to the profession, based on a sense of professional success and life satisfaction.

The questionnaire consists of 66 statements combined into 11 scales. Each scale consists of six statements, the degree of agreement with which is evaluated by the examinee on a 5-point scale ranging from «Strongly Agree» – 5 points to «Strongly Disagree» – 1 point. Depending on the ratio of indicators on different scales, we determine the type of behavior in a professional environment that allows inferring the presence or absence of professional burnout syndrome. Interpretation of results according to the AVEM method: 6–10 points – especially low values; 11–15 – low

values; 16–20 – average values; 21–25 – high values; 26–30 – extremely high values [8, 12].

Results of research and their discussion

Use of AVEM questionnaire showed that no students with extremely high or extremely low parameters were observed. High values imply active coping strategies, striving for excellence, satisfaction with life and professional ambitions, in both the first year students and the fourth. High values in the fourth year students relate to the feeling of success in professional work and willingness to expend energy, which reflects the maturity and constructive attitude to professional activities. Assessment of mental load on the students is reflected in AVEM questionnaire individual scales (Table 1).

As can be seen from the above data, students are highly active in learning activities, which results in an increased susceptibility to energy costs and high professional claims. High activity level is consistent with a moderate tendency to refusal in case of failure. Noteworthy is the average level of a sense of social support from the immediate environment. This can be explained by adaptation of the first year students to the new conditions of learning environment. During this period, a new social role of a student is formed. At the same time, it becomes the basis for the formation of active coping strategies and, as a result, an increased success of one's activities.

A number of features peculiar to professional adaptation stage characterizes the process of first year students' social adaptation. On the foreground stands the need for selection, competition as well as efforts to achieve higher social status in the student group. Another problem of this period of study is the requirement for increased independence and the ability to make decisions in difficult circumstances when being first exposed to student activity [11].

Table 1

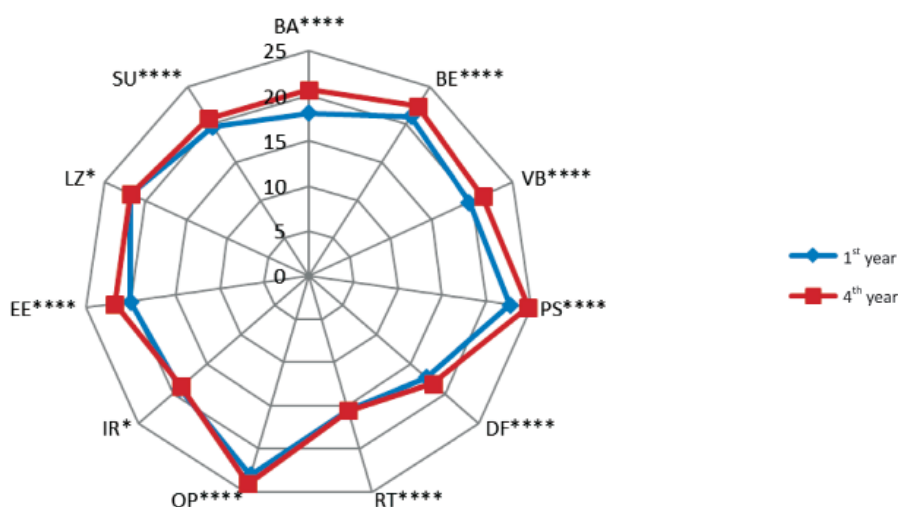
Behavioral features of the first and the fourth year students
of a multidisciplinary university on AVEM scale

Scale	First year students $n = 368$		Fourth year students $n = 376$		p
	M \pm m	25–95 %CI	M \pm m	25–95 %CI	
BA	18,07 \pm 0,12	17,84–18,31	20,66 \pm 0,15	20,35–20,96	0,000001
BE	21,03 \pm 0,17	20,68–21,36	22,367 \pm 0,15	22,06–22,67	0,000001
VB	19,64 \pm 0,18	19,28–20,01	21,31 \pm 0,16	20,98–21,63	0,000001
PS	22,66 \pm 0,22	22,23–23,10	24,65 \pm 0,23	24,19–25,11	0,000001
DF	17,28 \pm 0,12	17,04–17,52	18,26 \pm 0,14	17,98–18,53	0,0001
RT	15,55 \pm 0,22	15,12–15,99	15,55 \pm 0,28	14,99–16,11	0,0002
OP	23,03 \pm 0,19	22,65–23,42	24,04 \pm 0,20	23,64–24,44	0,00088
IR	19,03 \pm 0,15	18,72–19,33	18,74 \pm 0,14	18,45–19,03	0,09
EE	20,05 \pm 0,15	19,74–20,37	21,78 \pm 0,16	21,45–22,11	0,0001
LZ	21,77 \pm 0,15	21,47–22,07	21,79 \pm 0,15	21,49–22,09	0,06
SU	19,69 \pm 0,11	19,47–19,92	20,76 \pm 0,10	20,55–20,96	0,0001
Overall score	217,59 \pm 0,79	216,02–219,16	230,84 \pm 0,86	229,13–232,55	0,000001

Note : p – level of significance according to the Mann-Whitney-Wilcoxon test, Kolmogorov-Smirnov test and Wald-Wolfowitz runs test; M – mean; m – standard error (mean); 25–95 %CI – confidence interval.

For further interpretation of the results, we have carried out a comparative analysis of the AVEM questionnaire results of the first and the

fourth year students. As a consequence, it revealed statistically significant differences for individual scales of the questionnaire (Figure).



Comparative analysis of the AVEM questionnaire results of the first and fourth year students.
Note hereinafter: * – $p \leq 0,05$; ** – $p < 0,005$; *** – $p < 0,005$; **** – $p \leq 0,0005$ – confidence level when comparing student groups from the first and the fourth year of study; BA – Subjective activity value; BE – Professional ambitions; VB – Readiness to expend energy; PS – Striving for excellence; DF – Ability to maintain distance with respect to work; RT – Tendency to refuse in case of failure; OP – Active coping strategies; IR – Inner calm and balance; EE – Sense of success in professional activity; LZ – Satisfaction with life; SU – Sense of social support

Conclusions

1. Type B – burnout, not detected among students.
2. Type A – low tolerance to frustration and stress, found in 5,75 % females.

3. Type S – prevailed and had comparable values in both males and females (78,16 and 68,97 % respectively) – thrifty, frugal, with an average level of motivation, energy costs and professional ambitions.

Table 2

Gender features of students' behavior on the AVEM scale

Type of Behavior	Female students (n = 328)		Male students (n = 416)	
	n	%	n	%
Type S	60	68,97	68	78,16
Type G	18	20,69	19	21,84
Type A	5	5,75	0	0
Type B	0	0	0	0
Not defined	4	4,59	0	0

Note: Type S – thrifty, frugal, with an average level of motivation, energy costs and professional ambitions; Type G – healthy, active, capable of solving difficult problems, attaching high (but not extreme) importance to work, controlling his/her own energy costs, characterized by a constructive way of overcoming failures and defeats; Type A is characterized by extremely high subjective value of professional activities, a high degree of readiness for energy costs, low tolerance to frustration and stress; Type B – burnout type; marked by low subjective activity value, low stress tolerance, limited ability to relaxation and constructive solution of problems, tendency to abandon difficult situations, constant feeling of anxiety and pointless fear; Type of behavior associated with work is not defined.

4. Type G – healthy, active, capable of solving difficult problems, attaching high (but not extreme) importance to work, almost equal rate found in females and males – about 21 %.

5. Fourth year students are characterized by a high degree of readiness to energy costs, that may in itself be a risk of rapid deterioration and should be considered when distributing professional load.

6. In relation to the work, fourth year students tend to keep a distance, which in the long term may lead to professional dissatisfaction against the backdrop of the success of others.

7. In the fourth year, the significance of success in professional work and commitment to energy costs reflect the maturity and constructive attitude to the professional activity.

References

1. Arestova O. N., Voiskunsky A. E. Gender aspects of the Internet activity // *Humanities research on the Internet* / Edited by A. E. Voiskunsky. – M., 2000. – P. 290–313.
2. Barysheva, E.S. Medical and preventive aspects of students' health protection and promotion at the Orenburg State University / E.S. Barysheva, I.I. Cheremushnikova, N.O. Davydova, N.V. Grivko, T.A. Smantser // *Fundamental research*. – 2013. – No. 1. – P. 555–559.
3. Voiskunsky A.E., Mitina O.V. Men and women on the Internet: gender realities and stereotypes // 3rd Russian Conference on Environmental Psychology: Abstracts. – M., 2003. – P. 342–346.
4. Davydova, N.O. Gender features of psychophysiological aspects in student adaptation / N.O. Davydova, 5. Cheremushnikova, T.A. Smantser, E.S. Barysheva // *New medical technologies bulletin*. – 2013. – No.1. – - electronic edition.
6. Kulikov L. V. Determinants of life satisfaction // *Society and Politics: Current studies, search of concepts*. – St. Petersburg, 2000. – P. 476–510.
7. Mantrova I. N. Methodological guidance on psychophysiological and psychological diagnostics / I.N. Mantrova // *Neurosoft Ltd*. – 2008. – P.216.
8. Mitina O. V., Petrenko V. F. Cross-cultural study of female behavior stereotypes // *Questions of psychology*. – 2000. – No. 1. – P. 68–86.
9. Morgan K., Morgan M. Sex differences in the application of technology // *Humanities research on the Internet* / Edited by A. E. Voiskunsky. – M., 2000. – P. 267–289.
10. Nikiforov German Sergeevich *Health Psychology: A Textbook for higher educational institutions*.
11. Ronginskaya T. I. Prevention of stress among students // «Ananyev Readings-2001». – St. Petersburg, 2001.
12. Ozhigova L. N. Gender interpretation of self-actualization in the profession. – Krasnodar, 2000.
13. Workshop on gender psychology / Edited by I. S. Kleshtina. – St. Petersburg, 2003.
14. Cheremushnikova I.I., Smantser T.A., Barysheva E.S., Davydova N.O. Analysis of the mechanisms of emotional intensity and individual personality traits of students // *Fundamental studies* – No.11(4). – Moscow: Published by «RAE», 2012. – P. 900–904.
15. Cheremushnikova, I.I. Analysis of psychophysiological adaptation of students based on autonomic component of anxiety and individually-typological features of personality / I.I. Cheremushnikova, Smantser T.A., Barysheva E.S., Davydova N.O. // *Siberian Journal of Medicine*. – 2013. – № 1. – P. 41–43.
16. Apfelbaum E. The role of popular culture in women's ways of overcoming socio-cultural demands // *International Journal of Psychology: Abstracts of XXVII International Congress of Psychology*. – Stockholm, 2000. – P. 278.
17. Bade M. Emotional intelligence, anger and irrational beliefs among college students // *International Journal of Psychology: Abstracts of XXVII International Congress of Psychology*. – Stockholm, 2000. – P. 321.
18. Bendas T. V. Gender and cultural differences of student leaders in success, sexual attractiveness and leadership style // *International Journal of Psychology: Abstracts of XXVII International Congress of Psychology*. – Stockholm, 2000. – P. 73.
19. Bendas T. University manager: gender and cultural differences in effectiveness, motivation and identity // *The Tenth European Congress on Work and Organizational Psychology*. – Prague, 2001. – P. 21.
20. Bergman B. Gender equity and health // *International Journal of Psychology: Abstracts of XXVII International Congress of Psychology*. – Stockholm, 2000. – P. 17.

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QUALITY INSPECTION METHODOLOGY IN DORSOPATHY'S TREATMENT

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Standardized questionnaires as a method of treatment's results assessment became routine in clinical trials practice, including vertebrology practice. There were developed series of expert approaches for patients with back pain, which are definitely important for analysis of administered treatment. In our work we implemented in a consistent manner the most often used scales, questionnaires and inventories: SF-36, SF-12, ODI, RDQ, QBPdq, BPFS, VAS, NRS, CPGQ, MPQ, WLQ, Macnab, Prolo, LBOS. In order to get an objective estimation of clinical and performance status in patients with vertebrological disorders we carried out general and instrumental methods of analysis. However, none of them allow getting a clear view of the fact to what extent the disease and diagnosis «vertebral osteochondrosis» limit live activity of the real patient, his ability to participate in social, occupational activity and activities of daily living. In accordance with principles of evidence-based medicine we decided to carry out treatment's results assessment by using the quality of life index. New quality of life evaluation technic and author's recommendations for data assessment were established.

Keywords: vertebrology, dorsopathy, quality of life control, quality inspection

Treatment quality inspection by using standardized quantitative rating scales and questionnaires became routine in clinical trials practice, including vertebral orthopedic and neurologic practice. They are used for matched patient groups' selection, response to the treatment's comparison, treatment outcomes' prognosis and risk groups' identification [1, 2, 4, 5, 8, 11, 16, 21, 22, 28, 31, 32]. Nowadays there is no unified approach of these methods using in Russia. In this paper we give the ways to systematization of the most commonly used scales and questionnaires, and provide recommendations concerning data estimation.

1. Quality of life estimation

Usually it is used an integrated specification – quality of life (QOL), that comply with CONSORT recommendations (Consolidated Standards of Reporting Trials) [8]. QOL is particularly important for patients with comorbidities, as these conditions can influence on treatment efficacy. It is also important for different trials' results comparison, carrying-out an economic analysis and clear understanding of the problem in the context of health care service modernization.

Quality of Life questionnaire SF-36 (Short Form) [6, 27, 30] was developed by RAND (Research and Development corporation) as part of Medical Outcome Study, MOS. Later research team published the shipping version of RAND-36™ questionnaire. Questionnaires SF-36 and RAND-36 consists of the same set of questions, but have differences in evaluating «general health» and «pain». It should be taken into account while comparing study results obtained by using questionnaire's different modifications [27]. Questionnaire SF-36 is not specific for treatment's results assessment in patients with vertebrogenous disorders. But it is important for QOL evaluation in patients

expecting vertebral surgical operations, that's proved by a number of studies.

In general, SF-36 corresponds with specificity, accuracy, sensitivity and number of questions. There is wide experience of using it among big patients groups. Also SF-36 has advantages in results distribution (mean and standard deviation) in large and varied samplings. This questionnaire has been translated into more than 40 languages. There are also it short versions – SF-12 and SF-8 [30]. Using questionnaire SF-12 in large population-based cohort study where QOL assessment isn't a primarily endpoint could be a good compromise between quality of the study and time needed for filling and data handling [6].

Oswestry Disability Questionnaire (Oswestry Disability Index (ODI)) was developed in 1980 [10]. Nowadays it is commonly used for disability status assessment in patients with spinal disorders [7, 15]. Version 2.1a of Oswestry Disability Questionnaire is available now; it consists of 10 sections. The maximum score for each section is 5. Oswestry Disability Index is calculated as follows: (total score of the patient/total possible raw score) X 100.

Roland-Morris Disability Questionnaire (RDQ) was published by M. Roland and R. Morris in 1983 [24]. We used this questionnaire for assessment of low back pain influence on disability. RDQ was used for assessment patients with acute and subacute back pain syndrome [9]. Questionnaire consists of 24 questions. Doctor adds up the number of items checked by the patient; the score can therefore vary from 0 to 24. The more the sum is, the more level of disability is. Clinical improvement over time can be graded based on the analysis of serial questionnaire scores; the improvement express as a percentage.

Quebek Back Pain Disability Scale, QBPdq [16], was developed by authors' team in

1995. It measures the difficulty in performing 20 daily activities by 5-point scale. The item scores are summed for a total score between 0 and 100, with higher numbers representing lower levels of QOL. The set of questions for Quebec Back Pain Disability Scale came out of vast number of signs as a result of factorial analysis, confidence estimation and correlation with regard to sensitivity. The scale authors supposed that this method represents the most accurate changes in patients QOL.

The Back Pain Function Scale of Stratford, BPFS [25], was developed by P. Stratford and L. Riddle in 2000 to evaluation functional ability in patients with back pain. It measures the ability in performing the most common activities (12) by 5-point scale: any of usual housework, recreational or sporting activities, performing heavy activities around home, hobbies, putting shoes or socks, bending, lifting things from the floor, sleeping, standing or sitting for 1 hour, going up 2 stairs, driving for 1 hour. The score strongly correlates with the abovementioned Roland-Morris questionnaire. By comparison with QBPDQ the ODI has the advantages in evaluating patients with low back pain [12]. Roland-Morris Disability Questionnaire and Oswestry Disability Questionnaire are specific to vertebrologists, so they are easy operating and fail-safe [3, 6].

2. Evaluation of present pain intensity

Pain is the subjective symptom that is under study of vertebrology [2]. Most vertebrologists agree that pain relief is the main parameter of benign treatment outcome. Moreover, many patients expect significant or full pain relief after appropriate treatment [14]. Pain's severity evaluation differs from pain's influence evaluation on general well-being. Pain's severity is characterized by the degree of patient distress, whereas pain's influence is complex term reflecting changes in mental status caused by pain and pain influence on patient's QOL. Pain's severity evaluation is enough advanced, while there are a lot of open questions in pain's influence assessment. So, it's impossible to divide questionnaires and scales in two groups, such as scales to evaluate only pain's severity or only QOL.

The simplest, most convenient and commonly used scale for pain's severity evaluation is visual analog scale – VAS. VAS is usually a horizontal line, 10 cm in length [29]. The patient should mark the point on the line that corresponding to the pain's severity he experienced. One end of the line is marked «0» that means «no pain», the other end is marked «10» that means «worst possible pain». The VAS score is determined by measuring in millimetres from the left hand end of the line to the point that the patient marks.

Numerical rating scale (NRS) is also widely used for pain's severity evaluation. It consists of 11 points from 0 (no pain) to 10 (worst possible pain). Its advantages are independence from good eyesight, availability of writing materials and possibility to use them. It can be used even during phone conversation with patient. Scales with pictures of happy and unhappy faces are used for children. VAS and NRS are used for subjective patient pain's evaluation during examination. In the number of scales pain and QOL are evaluated simultaneously (some of them pay more attention to pain's influence, whereas others concentrate on QOL). VAS and NRS usability is based on the fact that they could be used for time course pain's evaluation within 24 hours or a week. Retrospective analysis is not preferable, so pain's memories could be inaccurate or even aberrant. It should be taken into account that pain's severity evaluation by using one of the scales (e.g. VAS) is subjective and couldn't reflect real patient's condition, especially in terms of anaesthetics influence. So, it is reasonable to use scales with different assessment principles.

While evaluating chronic and recurrent pain syndrome it's important to assess pain's severity during definite time interval instead of definite moment as at the clinical visit.

Chronic pain grade questionnaire, CPGQ [29], was developed in 1992 by Von Korff and J. Ormel [29]. Its distinctive feature is measurement of pain's duration, intensity and pain's influence on daily activities, rest and work during last month.

McGill Pain Questionnaire (MPQ) [7, 19, 20] was developed in 1975 by R. Melzack at Canadian university. It was translated into several languages. It helps to measure the sensory, affective and other aspects of chronic pain. The questionnaire consists of 11 sensory and 4 affective verbal characteristics: 78 adjectives describing pain are classified into 20 subclasses according to semantic meaning increasing in quantitative terms. After analyzing the questionnaire three pain's characteristics are determined: sensory, affective and general. MPQ could be used for evaluation of pain's characteristics changes before and after treatment. The 2 major measures are: the Pain Rating Index (the sum of the scale values of each word chosen or their arithmetic mean) and the number of words chosen. Obtained results could be used not only for pain's evaluation, but also for patient's emotional state evaluation. Obtained data are not parametric, but could be used in statistical processing. Nevertheless, MPQ isn't used very often in vertebrogenic pain syndrome's studies because of extensive effort and absence of necessity in such detail pain's

characterization. CPGQ, SF-12 and ODI are found in between scales mainly evaluating QOL and scales evaluating only pain syndrome.

3. Disability examination

Not much attention at literary sources is paid to outcomes' assessment in the context of professional suitability and possibility of employment [2]. However, these criteria are very important for economic analysis of the health care industry and also for estimation their influence on QOL and treatment satisfaction of patient, employer and doctor. In our opinion, occupational status should be evaluated at the first visit to doctor and after the rehabilitation programme. It is recommended to check the time of disability appeared, rehabilitation period's duration and disability status (if applicable). For example, SF-36 has questions about limitation of work capability in the social role functioning section. However, the questionnaire doesn't describe disability status whereas evaluate capabilities to different kinds of activities.

The Work Limitations Questionnaire was published by D. Lerner et al. in 2001 to estimate disability status in patients with chronic pain syndromes [2, 18]. It consists of 24 items combined into 4 subscales:

1. «Time management» contains 5 items that address difficulty handling time and scheduling demands.

2. «Physical demands» includes 6 items that covers a person's ability to perform job tasks that involve bodily strength, movement, endurance, coordination and flexibility.

3. «Mental-interpersonal demands» includes 9 items addressing cognitive job tasks, and on-the-job social interactions.

4. «Output demands» includes 5 items concerning diminished work quantity and quality. Subscale scores range from 0 (limited none of the time) to 100 (limited all of the time) and represent the reported amount of time in the prior two weeks respondents were limited on-the-job.

It should be noted that disability status is evaluated not only by specifically developed scales like WLQ, but also by most QOL questionnaires as previously mentioned.

4. Disease outcome measures

The important outcome criterion is treatment satisfaction of patient. There are a lot of approaches to quantitative assessment of this value. Some of them contain only several general questions, whereas others are very specialized [2].

Subjective Macnab's scale is the most mentioned and simplest in use scale. By this scale patient estimate the result of the treatment as «excellent», «good», «fair» or «poor».

The Patient Satisfaction Scale was developed in 2002 by T. Morita. It contains questions connected with awareness of treatment, emotional support and treatment efficacy. In general it helps to estimate patient's satisfaction with medical care at the hospital. According to Byval'tsev V.A. et al., (2011) patient's satisfaction with treatment consists of many components, so it is impossible to do complete evaluation by one scale. For example, some patients give priority to communication with doctor rather than equipment used during surgery. So, this fact should be noted while using scales described in the paper.

Prolo scale [23] is used for evaluation of patients' economic and functional status. It was developed by neurosurgeon D. Prolo in 1986 especially for patients who have undergone spine surgeries. Two aspects could be estimated by Prolo scale: economic outcome (with due regard to disability status) and functional outcome (with due regard to patient's physical activity). The final score is calculated by summing up of two criteria scores: economic and functional status. Score of 9–10 are considered excellent, 7–8 – good, 5–6 – fair and < 4 – poor [5, 23]. It's not necessary to evaluate economic status of spine surgeries as a part of routine medical practice, but it could be useful for healthcare managers. However, general treatment cost's calculation also could be one of the surgery's outcome criteria.

The Low-Back Outcome Scale (LBOS) [11, 25] was published in 1992 for measuring functional treatment outcome in patients with low back pain [13, 26]. Treatment outcomes are estimated as «excellent», «good», «fair» or «poor» according to answers to 13 questions about pain's intensity, working capacity, capability to active physical and daily activity. So, LBOS helps to evaluate outcomes by taking into account many aspects of patient's everyday activities. It could be recommended for routine use.

During the course of trials conducting we developed specialized questionnaire «QOL of patient with spine disorder». It was designed with accordance to following general requirements: universality, reliability, repeatability, usability, laconicism, standardization, correspondence with main QOL criteria recommended by World Health Organization (1992), scientific-production association «Medsotseconominform» (2000), Ju.P. Lisitsin's guidance (2011).

It was decided to develop specialized software program to automatic data processing based on specialized questionnaire «QOL of patient with spine disorder» (Fig. 1).

Algorithms and software program were designed for automatic data processing [4].

Image acquisition, processing, analysis and storage of data on patients with disease of the spine © Samara, 2011

Enter the values of features (symptoms)

Name of feature	Value
Full name	Ivanov
Years old	32
Diagnosis	
Workplace	
Total experience	12
Experience in the specialty	5
Date of completion	11.12.2011
Are you concerned about the pain in the back or legs (stiffness , numbness , burning)	Very strongly
As expressed in these painful feelings?	No
Whether they affect the general condition (discomfort , sleep disturbance, appetite , anxiety) ?	Moderately
How much pain interfere with household jobs (shopping, laundry, cleaning) ?	Very strongly
How much effect on your state of public life (restriction znakomst , psescheny) ?	Moderately
Burghers whether painful manifestations physiotherapy exercises , physical exercise helpful ?	Moderately
Burghers Do you pain in the spine engaged in work or study ?	Little
Did your relationships with others (partners, family, friends, relatives)?	Very strongly
Was there a problem in your marriage because of the condition of the spine?	No
How tiring you spine treatment?	Moderately

Outcome measure of quality of life (QOL)

Settings

Clear Fields

Calculation of results

Print

About the program

Exit

Fig. 1. Main window for input, processing, analyzing and information storing of patients with spine disorders

Calculating of relative values including values of abovementioned expert method before and after treatment are represented in Table 1 and 2.

Relative values obtained before treatment

Table 1

Sign	Weighted average	Degree of impact	Relative difference	Mean error
Tonomiometriya (before treatment)	-0,0171	3034,5029	-0,0171	0,0004
Pain's severity measured by VAS before treatment	-0,0088	47,7401	-0,0088	0,0002
Muscle strength (by Haribov) before treatment in affected segment	0,0182	3034,5534	0,0182	0,0004
Integrated QOL before treatment by author's questionnaire	-0,0039	3034,3997	-0,0039	0,0001
Duration of disease recurrence before visiting a doctor	-0,0507	66,227	-0,0507	0,0012
Numeric rating scale before treatment	-0,0165	3034,5621	-0,0165	0,0004
CPS before treatment	0,0096	3034,5629	0,0096	0,0002
Oswestry Disability Questionnaire before treatment	0,0103	39,3806	0,0103	0,0003
Roland-Morris questionnaire before treatment	0,0053	3034,5615	0,0053	0,0001
Neck Pain and Disability Index (Vernon-Mior) before treatment	0	3034,563	0	0
R.Watkins score before treatment	-0,0057	3034,5572	-0,0057	0,0001
McGill Pain Questionnaire (short form) before treatment	0,0011	70,0629	0,0011	0
Waddell Disability Index before treatment	-0,0127	3034,5629	-0,0127	0,0003

It should be noted that many questionnaires and scales consist of Likert-type questions (american psychologist's scale) and the respondent is asked to evaluate the level of agreement or disagreement by five levels:

- 1) strongly disagree;
- 2) disagree;
- 3) neither agree nor disagree;
- 4) agree;
- 5) strongly agree.

Table 2

Relative values obtained after treatment

Sign	Weighted average	Degree of impact	Relative difference	Mean error
Pain's severity measured by VAS after treatment	0,092	57,8	0,092	0,0022
Integrated QOL after treatment by author's questionnaire	-0,0172	52,3011	-0,0172	0,0004
Tonomiometriya (after treatment)	0	3034,563	0	0
Pain syndrome relief by WOMAC after treatment (in %)	0,0127	75,8436	0,0127	0,0003
Numeric rating scale after treatment	0	3034,563	0	0
Oswestry Disability Questionnaire after treatment	-0,0155	42,7411	-0,0155	0,0004
Roland-Morris questionnaire after treatment	-0,0633	3034,5623	-0,0633	0,0015
Neck Pain and Disability Index (Vernon-Mior) after treatment	0	3034,563	0	0
R.Watkins score after treatment	0	3034,563	0	0
McGill Pain Questionnaire (short form) after treatment	-0,0341	73,3465	-0,0341	0,0008
Waddell Disability Index after treatment	0,0181	3034,5626	0,0181	0,0004

Central tendency and variance could be calculated while processing data obtained by using Likert scale. These values should be considered as median or mode with interquartile range, in other words non-parametric tests should be used. Central limit theorem helps to carry out a parametric analysis [2, 3, 4]. In connection with these facts, it could be recommended to use non-parametric tests for processing data obtained by scales and questionnaires. It could be explained by the fact that many scales describe nominal data, so probability distribution is not always Gaussian distribution. Nowadays there are different software programs that help to perform statistical analysis (i.e. Statistica, StatSoft, Inc).

We used the software package «STATISTICA 6.0» in our work. It helps to figure the data in accordance with Gaussian probability law. Mathematical analysis' results of obtained data are represented in Fig. 2 for describing basic tendencies. The x-axis represents patients groups before and after treatment, the y-axis represents values of integral QOL index measured in scores.

Represented data show that some patients had high integral QOL index (about 26 scores) before treatment, whereas half of patients (50% percentile rank) had integral QOL index within 10–15 scores which is equivalent of poor quality of life.

As a result of appropriate combination treatment we observed marked increase in integral QOL index among most patients. 50% percentile rank includes values within 17–27 scores which is equivalent of high or fair level of this index.

Scales for evaluating QOL, occupational disability and capability are designed for between-group analysis. Many experts consider that they could be used for individual clinical

decision-making. It is necessary to take into account significant variation in scores for each scale. There are two types of significance: statistical and clinical. In statistics, a result is called statistically significant if there is statistical evidence that there is a rather large difference. If there is a statistical significance in evaluating by different scales it doesn't mean that there is appropriate clinical significance. So, it's important to determine minimal important change – least significant change for patient. Knowing the minimal important change helps to evaluate results before and after treatment and draw the conclusion concerning the importance of health gain for the patient. So, some experts think that minimal important change is the main value for making personal opinion and clinical decision. Moreover, minimal important change is useful for determining sample size for clinical trial.

Generally, SF-36 is used as a standard for detection minimal important change. According to clinical trial results as a part of VIII International Forum on Primary Care Research on Low Back Pain (Amsterdam, 2006) were determined following minimal important changes: 15 mm for the VAS, 2 scores for the NRS, 5 scores for the Roland Disability Questionnaire, 10 for the Oswestry Disability Index, and 20 for the QBDQ. It was also mentioned that a 30% improvement was considered a useful threshold for identifying clinically meaningful improvement on each of these measures [21].

So, criteria universalization of observation results by using above-described methods in vertebralology helps to objectify and compare treatment outcomes in different clinics and centres. It could simplify professional communication and improve clinical trials quality in Russia.



Fig. 2. Mathematical analysis' results of integral QOL index in patients with degenerative disc disease over treatment course

References

- Byvaltsev V.A., Sorokovikov V.A., Egorov A.V. etc. A comparative analysis of the effectiveness of endoscopic and endoscopic-assisted microsurgical discectomy in the treatment of patients with herniated lumbar intervertebral discs // *Questions of Neurosurgery*. – 2010. – № 4. – 20–6.
- Byvaltsev V.A., Belykh E.G., Sorokovikov V.A., Arsenatieva N.I. The use of scales and questionnaires in spine surgery. *Journal of Neurology and Psychiatry*. – 2011. – № 9. – P. 51–56.
- Glantz S. *Biomedical Statistics*. – M: Practice 1998. – 460.
- Lysov N.A., Chebykin A.V. Minaev J.L., Supilnikov A.A. Acquisition, processing, analysis and storage of data on patients with spinal cord injuries // *Certificate of state registration of computer programs number 2012615977*, 29.06.2012.5. Ann Y., Lee S.H., Lee J.H. et al. Transforaminal percutaneous endoscopic lumbar discectomy for upper lumbar disc herniation: clinical outcome, prognostic factors, and technical consideration. – *Acta Neurochir* 2009. – 151. – 199–206.
- Beaton D.E., Bombardier C., Guillemin F. et al. Guidelines for the process of cross-cultural adaptation of self-report measures // *Spine*. – 2000. – Vol.25. – P. 3186–3191.
- Bombardier C. Outcome assessments in the evaluation of treatment of spinal disorders. – *Spine* 2000. – № 25. – 3097–3099.
- Brock M., Kunkel P., Papavero L. Lumbar microdiscectomy: subperiosteal versus transmuscular approach and influence on the early postoperative analgesic consumption // *Eur Spine J.* – 2008. – 17. – P. 518–522.
- Consolidated Standards of Reporting Trials <http://www.consortstatement.org>.
- Davidson M., Keating J.L. A comparison of five low back disability questionnaires: reliability and responsiveness // *Phys Ther.* – 2002. – 82. – P. 8–24.
- Fairbank J.C., Davies J.B. The Oswestry low back pain disability questionnaire // *Physiotherapy*. – 1980. – 66. – P. 271–273.
- Finneson B.E. Lumbar Disc Excision. *Operative Neurosurgical Techniques: indications, methods, and results*. Eds. H.H. Schmidek, W.H. Sweet. – 3rd edition. – 1905–1923; 3.
- Fritz J.M., Irrgang J.J. A comparison of a modified Oswestry Low Back Pain Disability Questionnaire and the Quebec Back Pain Disability Scale // *Phys Ther.* – 2001. – 81. – P. 776–788.
- Greenough C.G., Fraser R.D. Assessment of outcome in patients with low-back pain. – *Spine*, 1992. – 17. – P. 36–41.
- Haefeli M., Elfering A., Aebi M. et al. What comprises a good outcome in spinal surgery? A preliminary survey among spine surgeons of the SSE and European spine patients // *Eur Spine J.* – 2008. – 17. – P. 104–116.
- Hashimoto H., Komagata M.L., Nakai O. et al. Discriminative validity and responsiveness of the Oswestry Disability Index among Japanese outpatients with lumbar conditions // *Eur Spine J.* – 2006. – 15. – P. 1645–1650.
- Kopec J.A., Esdaile J.M. et al. The Quebec back pain disability scale. Measurement properties. – *Spine*, 1995. – 20. – P. 341–352.
- Lattig F., Grob D., Kleinstueck F.S. et al. Ratings of global outcome at the first post-operative assessment after spinal surgery: how often do the surgeon and patient agree? // *Eur Spine J.* – 2009. – 18. – P. 386–394.
- Lerner D., Amick B.C., Rogers W.H. et al. The Work Limitations Questionnaire // *Med Care*. – 2001. – 39. – P. 72–85.
- McGill Pain Questionnaire, MPQ https://www.cebp.nl/vault_public/filesystem/?ID=1400.
- Melzack R. The McGill Pain Questionnaire: major properties and scoring methods. – *Pain*, 1975. – 1. – P. 277–299.
- Ostelo R.W., Deyo R.A., Stratford P. et al. Interpreting change scores for pain and functional status in low back pain: towards international consensus regarding minimal important change. – *Spine*, 2008. – 33. – P. 90–94.
- Pain: Clinical Updates <http://www.iasp-pain.org>.
- Prolo D.J., Oklund S.A., Butcher M. Toward uniformity in evaluating results of lumbar spine operations: a paradigm applied to posterior lumbar interbody fusions. – *Spine*, 1986. – 11. – P. 601–606.
- Roland M.O., Morris R.W. A study of the natural history of back pain. Part I: Development of a reliable and sensitive measure of disability in low back pain. – *Spine*, 1983. – 8. – P. 141–144.
- Stratford P.W., Binkley J.M. et al. Development and initial validation of the Back Pain Functional Scale. – *Spine*, 2000. – 25. – P. 2095–2102.
- Schmidek, W.H. Sweet. – 3rd edition. – 1941–1956; 3.
- Tarlov E.C. Chapter 157 Surgery of Ruptured Lumbar Intervertebral Disc. *Operative Neurosurgical Techniques: indications, methods, and results*. Eds H.H. The Low-Back Outcome Scale, LBOS https://www.cebp.nl/vault_public/filesystem/?ID=1394.
- Virani M.J., Chopra I. *Microsurgical Discectomy*. Textbook of operative neurosurgery. Ghaptex Edyets: Ramamurthi R. et al. New Delhi 2005; 1055.
- Von Korff M., Ormel J., Keefe F.J. et al. Grading the severity of chronic pain. – *Pain*, 1992. – 50. – P. 133–149.
- Ware J., Kosinski M., Keller S.D. A 12-Item Short-Form Health Survey: construction of scales and preliminary tests of reliability and validity // *Med Care*. – 1996. – 34. – P. 220–233.
- Wewers M.E., Lowe N.K. A critical review of visual analogue scales in the measurement of clinical phenomena. *Res Nurs Health* 1990; 13: 227–236. WHO's pain ladder <http://www.who.int/cancer/palliative/painladder/en>.

THE COMPARATIVE ANALYSIS OF SELENORGANIC COMPOUNDS EFFECT ON CLINICAL STRAINS OF ESCHERICHIA COLI

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In work was studied the effect of selenorganic compounds 1,5-diphenyl-3-selenapentadion-1,5 and its nitro-, chloride- and fluoride-derivatives on clinical strains of *Escherichia coli* extracted from patients with suppurative complications of traumatology and orthopedic hospital. 90-minutes incubation of *E. coli* with compounds 1–4 in concentration 1 mg/ml has led to inhibition of bacterial colonies growth on 43,4; 95,2; 90,0% and 100% correspondingly. Use of compounds 2–4 in concentration 0.1 mg/ml decreased the quantity of colonies on nutrient agar on 85,1; 51,1 and 100% correspondingly but in concentration 0,01 mg/ml on 64,8; 31,2 and 94,6% correspondingly. Among the investigated substances only compounds 3 and 4 in concentration 0,001 mg/ml have reduced colonies growth of *Escherichia coli* on 29,3 and 77,6% correspondingly. It is possible that antibacterial activity of the investigated compounds is defined by the presence of lateral substitutes (chlorine-, fluoride- and nitro-groups) in its structure. The compounds take toxicity due to lateral substitutes and have an antibacterial effect.

Keywords: selenium, selenorganic compounds, *Escherichia coli*, antibacterial effect

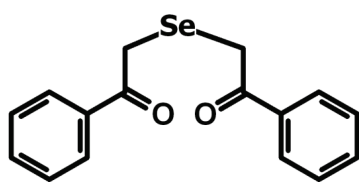
The increasing number of antibiotic resistant bacterial strains determines importance of synthesis of new antibacterial compounds and studying of their effects [1]. Organic compounds of selenium are considered as perspective. Recently was shown high antibacterial activity of some selenorganic compounds [3, 5].

At present selenorganic compound 1,5-diphenyl-3-selenapentadion-1,5 or diacetophenonylselenide (DAPS-25) is used in animal and poultry farming in a number of regions of Russia. Synthesis and studying of biological activity of its derivatives are carried out [4].

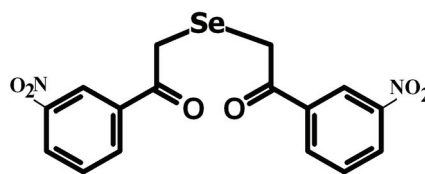
The aim of the study: to analyze comparative antibacterial activity of selenorganic compound diacetophenonylselenide (DAPS-25) and its chloride-, fluoride- and nitro-derivatives on clinical strains of *Escherichia coli* extracted from patients with suppurative complications of traumatology-orthopedic hospital.

Materials and methods of research

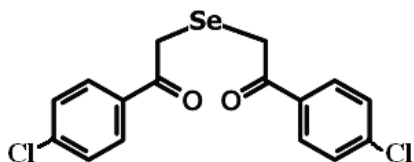
In this work we used selenorganic compounds 1,5-diphenyl-3-selenapentadion-1,5 (DAPS-25 – compound 1), 1,5-di – (m-nitrophenyl)-3-selenapentadion-1,5 (compound 2), 1,5-di – (p-chlorophenyl)-3-selenapentadion-1,5 (compound 3) and 1,5-di – (p-fluorophenyl)-3-selenapentadion-1,5 (compound 4), kindly given by a professor B.I. Drevko (Figure).



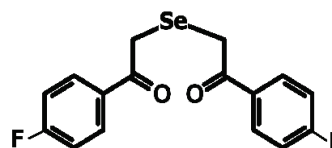
Compound 1



Compound 2



Compound 3



Compound 4

Structures of selenorganic compounds: 1,5-diphenyl-3-selenapentadion-1,5 (compound 1), 1,5-di – (m-nitrophenyl)-3-selenapentadion-1,5 (compound 2), 1,5-di – (p-chlorophenyl)-3-selenapentadion-1,5 (compound 3) and 1,5-di – (p-fluorophenyl)-3-selenapentadion-1,5 (compound 4)

Experiment was carried out on 10 taxonomic identical clinical strains of *Escherichia coli* (*E. coli*) extracted from patients with suppurative complications which are on treatment in a traumatology and orthopedic hospital of the Saratov scientific research institute of traumatology and orthopedics. Generic identification of strains has carried out on the basis of studying phene. Bacteria had resistance to five and more structural antibiotics. Suspension of bacteria prepared with use the turbidity standard of the State scientific research institute of standardization and the control of medical biological preparations n.a. L.A. Tarasevich, by consecutive cultivations to final concentration of bacteria – $3 \cdot 10^5$ cells in 1 ml.

For investigation of antibacterial action we prepared 4 dilutions of selenorganic compounds in concentrations 0,001–1 mg/ml. The mix of dimethylformamide (DMFA) in 0,9% solution NaCl in the relation 1:10 is used as a solvent. Aliquot of 100 μ l of final suspension of microorganisms was added in test tubes with diluted compounds and incubated for 90 minutes at a room temperature. As the control group used the same quantities of bacterial suspension dissolved in similar proportions with the solvent (DMFA in 0,9% solution NaCl) and incubated for the same time interval. Then aliquot of 100 μ l of bacterial suspensions from each test tube inoculated and spread on nutrient meat-peptonic agar which was incubated for 24 hours at 37°C. Counting of colonies was made next day.

Statistical analysis of finding carried out by means of software package Statistica 6.0. We checked hypotheses about a kind of distributions (Shapiro-Wilk's criterion).

A lot of findings did not fit of distribution law. For comparison of values the U-Mann-Whitney's criterion, Z – Fisher's criterion and a p-value were determined. A critical significance of p-value in this research accepted equal 0,05.

Results of research and their discussion

The results depicted in Table show the increase of antibacterial activity of selenorganic compounds against clinical strains of *E. coli* in a direction: 1 \rightarrow 2 \rightarrow 3 \rightarrow 4.

90-minutes incubation of *E. coli* with selenorganic compounds in maximal concentration 1 mg/ml led to inhibition of bacterial colonies growth on 43,4% (compound 1), 95,2% (compound 2), 90,0% (compound 3) and 100% (compound 4) correspondingly in comparison with control. Use of selenorganic compounds 2, 3 and 4 in concentration 0,1 mg/ml decreased the quantity of colonies on nutrient agar on 85,1%, on 51,1% and on 100% correspondingly, and in concentration 0,01 mg/ml – on 64,8; 31,2 and 94,6% correspondingly in the comparison with control. Among the studied substances only compounds 3 and 4 in minimal concentration 0,001 mg/ml significantly reduced growth of *E. coli* colonies on 29,3 and 77.6% correspondingly.

Antibacterial effect of selenorganic compounds 1–4 on clinical strains of *E. coli*

Compounds	Control group	The quantity of colonies on nutrient agar			
		Experimental groups, concentration of compound, mg/ml			
		1	0,1	0,01	0,001
1	821 (671; 907)	465 (256; 569) $Z_k = 2,72$; $p_k = 0,006502$,	685 (585; 1045) $Z_k = 0,30$; $p_k = 0,762369$,	929 (759; 1063) $Z_k = 1,47$; $p_k = 0,140466$,	762 (563; 983) $Z_k = 0,04$; $p_k = 0,969850$,
2	1046 (848; 1155)	50 (9; 163) $Z_k = 3,77$; $p_k = 0,000157$,	156 (94; 224) $Z_k = 3,77$; $p_k = 0,000157$,	368 (241; 490) $Z_k = 3,77$; $p_k = 0,000157$,	977 (790; 1093) $Z_k = 1,13$; $p_k = 0,256840$,
3	982 (867; 1108)	98 (74; 207) $Z_k = 3,77$; $p_k = 0,000157$,	480 (231; 652) $Z_k = 3,55$; $p_k = 0,000381$,	676 (561; 786) $Z_k = 3,32$; $p_k = 0,000881$,	694 (456; 841) $Z_k = 2,72$; $p_k = 0,006502$,
4	1003 (895; 1089)	0 (0; 6) $Z_k = 3,77$; $p_k = 0,000157$,	1 (0; 9) $Z_k = 3,77$; $p_k = 0,000157$,	54 (11; 118) $Z_k = 3,77$; $p_k = 0,000157$,	225 (67; 342) $Z_k = 3,77$; $p_k = 0,000157$,

Notes: In each case is given median value, lower and top quartiles (25; 75%). Z_k , p_k – differences in comparison with control group.

Findings allow suggesting the part of lateral groups at the phenyl radicals in antibacterial effect of compounds 2, 3 and 4. For example, compound 1, lost of lateral groups at the phenyl radicals demonstrated minimal antibacterial effect on *E. coli*. Compound 2 has two nitro-groups in meta-position of phenyl radicals. It allows drawing an analogy with antibacterial effect of nitrofurans. It is known that nitrofurans get antibacterial activity after

reduction of nitro-groups by flavin-dependent nitro-reductases. They localize in bacteria, protozoa and tissues of organism. Intermediate products of consistent one-or two-electronic stages of reduction are highly reactive, especially nitro-radical anion due to nitrofurans get antibacterial activity [2].

Besides compounds 3 and 4 have chlorine and fluorine atoms in para-position of phenyl rings. It is known that fluorine is the most

electronegative element and the most powerful oxidizer. Due to presence of two fluorine atoms the compound 4 was got prooxidant properties and as consequence was become the most toxic of all investigated selenorganic compounds showing the maximal antibacterial activity. Oxidizing properties of chlorine are much weaker, than at fluorine. Therefore the chlorine-containing analogue of DAPS-25 (compound 3) has smaller antimicrobial activity in comparison with compound 4.

In this connection, it is possible to conclude that antibacterial activity of selenorganic compounds is caused by presence/absence of lateral groups at the phenyl radicals in its structure. Due to lateral groups the compounds have got toxicity and have had an antibacterial effect.

Conclusion

Findings allow suggesting the perspectives of using of selenorganic compounds 1,5-di – (m-nitrophenyl)-3-selenapentadion-1,5 (compound 2), 1,5-di – (p-chlorophenyl)-3-selenapentadion-1,5 (compound 3) and 1,5-di – (p-fluorophenyl)-3-selenapentadi-

on-1,5 (compound 4) as antibacterial compound against antibiotic-resistant bacterial strains of *E. coli*.

References

1. Baquero, F.; Coque, T.M.; de la Cruz, F. Ecology and evolution as targets: the need for novel eco-evo drugs and strategies to fight antibiotic resistance // *Antimicrob. Agents Chemother.* – 2011. – Vol. 55. – P. 3649–3660.
2. Glybochko P.V., Svistunov A.A., Borodulin V.B., Rusetskaya N.J. Nitrofuranes: chemical structure and biological activity. – Saratov: Publishing house of the Saratov medical university, 2010. – 199 p.
3. Pietka-Ottlik M., Wójtowicz-Młochowska H., Kołodziejczyk K., Piasecki E., Młochowski J. New organoselenium compounds active against pathogenic bacteria, fungi and viruses // *Chem Pharm Bull (Tokyo)*. – 2008. – Vol. 56. – № 10. – P. 1423–1427.
4. Rusetskaya N.Y., Goroshinskaya I.A., Borodulin V.B., Dimidov D.P., Borodulin Y.V. Antibacterial activity of selenorganic compound diacetophenonylselenid and its chloride-derivative on the clinic strains of *Pseudomonas aeruginosa* // *News of higher educational institutions. The North Caucasian region. Natural sciences.* – 2012. – № 4. – P. 69–72.
5. Wójtowicz H., Kloc K., Maliszewska I., Młochowski J., Pietka M., Piasecki E. Azaanalogues of ebselen as antimicrobial and antiviral agents: synthesis and properties // *Farmaco.* – 2004. – Vol. 59. – № 11. – P. 863–868.

*Materials of Conferences***IMPROVING ORGANIZATION OF WORK
FOR HEAD DOCTORS OF DENTAL
POLICLINIC DEPARTMENTS**

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Head doctor nowadays is a top-end professional in his specialty, indicated in his diploma. He is an organizer of healthcare who has obtained knowledge and skills via trial and error method, he is a self-taught lawyer, psychologist in his nature. Recommendations on improving work of head doctors are directed towards informatization, economic aspects of activity, improvements in dental care quality, automatization, training specialists in basics of planning-economic and financial activity of a dental polyclinic, order of executing economic and labour contracts.

Introducing new forms of organizing treatment-preventive care of population, obligatory and voluntary medical insurance, provision of paid services to legal and physical bodies has broaden official duties and the range of organization-management activity of head doctors in treatment-preventive institutions. These conditions initiate the necessity to re-direct function range of these specialists towards facilitating the totality of modern operative management methods that allow one to establish economic reasonability and the proper quality of dental care.

The goal of this research is to develop measures on improving work organization for head doctors of dental polyclinic departments.

According to this goal, we have questioned 124 head doctors of Moscow and Moscow region dental polyclinic departments with special cards, developed by us.

Research results. Qualification characteristics of jobs in healthcare sector provide for a correct selection and distribution of staff (order of the Ministry of medical and social development of RF dd. 23.07.2010 № 541N «On assertion of the Single qualification reference book of positions of managers, specialists, and employees, part «Qualification characteristics of jobs in healthcare sector»).

The need of dental polyclinics for high-qualified head doctors is formed under the influence of the following basic factors:

- The necessity of continuous refreshment of professional knowledge;
- An increase in work efficiency;
- Introduction of new technologies;
- Increase in quality of the provided services;
- Increase in patients' strictness towards quality of medical care services.

Structure of time, spent on carrying out prior management functions by these specialists, has the

following characteristic: «control» $61,48 \pm 0,14\%$ of total working time, «coordination» – $15,20 \pm 0,11\%$, «organization» $11,55 \pm 0,11\%$.

70,69% of a head doctor's functions are a subject of algorithmization, and 29,31% – 166,38 minutes of a business day are not suitable for algorithmization. Reasons of professional functions' algorithmization impossibility are defined by the very nature of dental polyclinic, as it is considered by modern management science as a complex open system, described by the phenomenon, called equifinality.

Planning of training and increase in personnel qualification is based upon the analysis of strategic problems that lie before a dental polyclinic, necessity to train staff according to recommendation of the implemented procedures (evaluation of a worker's activity, attestation, work with staff reserve), and plans of professional development of workers in structural divisions. Team work and collaboration implies an efficient delegation of powers, involving other employees into achieving the set objectives, and organization of a group work so that combination of these efforts leads to a synergetic effect. This effect makes collective efforts ten times more efficient than simply adding results of the same number of employees, working separately. Apart from administrative skills, a head doctor should also be able to increase team spirit and moral condition of a group, prevent and solve all possible conflicts efficiently.

As we know, a head doctor has to remember his key arrangements, meetings, and assignments, find the necessary information quickly on the everyday basis apart from carrying out a great number of other problems. However, only 13,71% of the respondents consider the information, available to them, sufficient to make a decision. Information is considered to be the main management resource the process of exchanging information is called «communication». Communication is a process, through which an idea is transferred from its source to a recipient in order to alter behavior of the former.

Nowadays informational systems, multi-functional program complexes, aimed to automatize accounting and management in a polyclinic, are being developed in priority. Facilitating such programmes allows us to solve such problems as:

- Maintenance of patients' files and digital medical card.
- Maintenance of a single database for a polyclinic with branched department structure.
- Automatization of reception work – broader set of functions.
- Maintenance of document circulation with insurance companies and enterprises: contracts, payments, insurance programmes, formation of reports.

- An operative analysis and control of a polyclinic's activity.
- Stock materials accounting.
- Accounting of teeth-technical laboratory operations.
- Statistic and medical reporting.
- Analysis of a dental polyclinic work efficiency.

However, only 5,79% of head doctors use an automated system of analyzing department activity. We should outline that all polyclinics maintain a monthly automated report of services and their costs according to OMC program. Also, annual report in dynamics of these indexes is provided only in 2–3 polyclinics that are a school of foremost experience.

Recommendations on improving work of head doctors are presented in a scheme:

1	Decrease in work load of head doctors due to breaking a department into smaller units via decrease in number of dental therapists, and surgeons (no more than 6 dentists).
2.	An appropriate equipment of the workplace (office), provision of computer technics and software.
3	Complex informatization and automatization of a department' activity. Introduction of multi-functional program complex into practice.
4.	Establishing possibilities of increase in skills and knowledge level in accordance with a position's requirements, especially in the area of organizing healthcare and social health.
5.	Setting high standards of quality and stimulating workers to improve their qualification.
6.	Formation of corporate identity that, in its turn, will provide for development of corporate culture.
7	Formation of professionally-significant psychological qualities of organization, intellectual, communicative nature, developing skills of communication and business contacts.

Scheme «Improving work of head doctors in dental polyclinics»

Training head doctors in organizing healthcare and social health is required. Final evaluation of knowledge in the area of management competences equals 40,8%, this value testifies for significant deficiencies in basics of planning-economic and financial activity of dental polyclinics, order of carrying out economic and labour contracts.

In order to achieve success, one has to realize his present condition, see his goal, understand methods of achieving it, and move towards the goal. Generally, we can define requirements that a head doctor of a department should meet. These requirements are defined through professionally-important qualities that we define as individual qualities of

an activity subject that influence efficiency of his activity and successfulness of mastering it. An answer for the question of qualities that a head doctor should possess, has suffered a significant evolution during the development of the theory of management. According to management activity of a head doctor we can outline the following professionally-important qualities: a skill to select and distribute employees, plan working process, provide a clear control, make decisions. Organization qualities are the result of displaying a number of psychological traits of a person. At this level intellectual qualities of a head doctor serve as basics of his development. An intellect can or cannot serve as a factor

of successfulness of a head doctor depending on what management resources, intellectual or competence, are introduced into his activity.

Many years of practical experience and modern scientific researches in the area of management prove that a leader's successfulness is defined by a whole complex of characteristics that he has to possess apart from knowledge. Head doctor nowadays is a top-end professional in his specialty, indicated in his diploma, he is an organizer of healthcare who has obtained knowledge and skills via trial and error method, he is a self-taught lawyer, psychologist in his nature.

The work was submitted to International Scientific Conference «Present-day problems of science and education», Russia (Moscow), February, 25-27, 2013, came to the editorial office 29.05.2013.

THE ANALYSIS OF HEALTH OF ORPHANS AND ORPHANED CHILDREN WITHOUT CARE OF PARENTS

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We studied 386 made in 2009 clinical records of children (form № 30), staying in inpatient institutions for orphans and children without parental care. Their morbidity and disability were analyzed. The groups of the children with similar a variety of diseases and the level of disability were allocated. On the results of the analysis of disability and morbidity of the orphaned children, the group of children with the highest risk for the development of a disability was allocated. The ultimate goal of the study is a conceptual approach and an optimization of the dispensary work among this category of children.

Introduction. Multifactor assessment of health status of children by conventional criteria allows not only verifying the disease itself, but also determines the level of its compensation dynamically, particularly the one of debilitating diseases. Among the causes of early children's disabilities, a leading role is played by congenital, hereditary chromosomal perinatal damaging factors [9]. According to the WHO recommendations, the grounds for establishing disability are:

- 1) consequences disease;
- 2) social insufficiency or social dysadaptation.

In children, a disease or a congenital defect without signs of past disease may serve as the grounds for declaring disabled. According to the data of the Ministry of Health and Social Development of the Russian Federation, the structure of child disability is as follows:

1. Functional disorders of the central nervous system, mental retardation and neuropsychiatric disorders (30%).

2. Neurological, neuromuscular disorders (20%).
3. Skeletal disorders, dysmorphogenetic features (20%).
4. Hearing disorders (17%).
5. Visual impairment (16%).
6. Disorders in congenital malformations (3,3%).
7. Functional organ failures in chronic somatic diseases (2,2%).

Handicapped children often have a combination of several types of social insufficiency [5]. The study objective is to give a generalized assessment of the health of children in orphanages, on the grounds of which to optimize the individual preventive work with these children, thereby reducing the risk of increasing in the number of handicapped children among orphans and children without parental care. The primary tasks are disability and morbidity analysis among orphaned children as well as the allocation of the group of children with the highest risk for the development of disability. The ultimate goal of the study is a conceptual approach and an optimization of the dispensary work among this category of children.

386 orphans' case follow-up records (form 30) made in 2009 were analysed. The age distribution of the children was as follows. There were 5,15% of children aged less than a year, 18,6% of children aged 1 to 2, 17,79% of children aged 2 to 3, 16,93% of children aged 3 to 4, 12,88% of children aged 4 to 5, 11,78% of children aged 5 to 6, 7,73% of children aged 6 to 7, 9,58% of children aged more than 7. The basic indices characterizing child morbidity and disability were singled out. The system of an integrated health assessment in children was carried out on six basic criteria: the anamnesis assessment: biological, genealogical and social; the physical development and the degree of its harmonicity; the neuropsychic development and the intelligence level; the resistance of the body; the functional state of organs and systems; the presence or absence of chronic diseases and congenital malformations. Based on all of the six mentioned criteria a multifactor assessment of health status of children is carried out with a conclusion about the child's belonging to one of the five existing health groups [1, 5, 7, 8, 9]. The obtained data were processed in VISUAL FOX-PRO 9, EXCEL 2007, STATISTICA 8. Extract, content analysis and linear statistics methods were used (determination of sample means and errors of the means) ($M \pm m$) [4]. Additionally, the cluster analysis method was applied [2, 3, 4].

The data on the proportion (percentage) of diseases of a specific class of all diagnosed diseases was analysed by the classes of the 10th revision of the International Statistical Classification of Diseases and Related Health Problems. The most common diseases are those of the nervous system, which constitute 15,2% of all identified diseases in children. The second place on the incidence belongs to «Congenital malformations, deformations

and chromosomal abnormalities», which constitute 15,2% of all diagnosed diseases in children. The next are «Endocrine system diseases» (13,2%), «Mental disorders» (11,5%) and «Symptoms, signs and abnormalities» (10,6%). In general, these dis-

eases account for 65,0% of all identified diseases in children.

To single out the characteristic features in the presence of different classes diseases in children in surveyed orphanages, the cluster analysis was used (Table).

Average values of the characteristics of children in each of 5 allocated groups

Characteristic	Group 1	Group 2	Group 3	Group 4	Group 5
Child's age (years)	2,03 ± 0,16	2,35 ± 0,14	2,69 ± 0,19	3,48 ± 0,40	2,70 ± 0,25
Body Height (cm)	70,28 ± 1,90	71,86 ± 1,89	76,22 ± 1,40	73,82 ± 5,23	68,60 ± 3,36
Body Weight (kg)	8,49 ± 0,36	9,90 ± 0,33	9,24 ± 0,35	11,04 ± 2,45	10,25 ± 0,67
Psychomotor Abnormalities	0,75 ± 0,05	0,33 ± 0,04	0,70 ± 0,05	0,82 ± 0,10	0,63 ± 0,06
Vegetative Abnormalities	0,73 ± 0,05	0,29 ± 0,04	0,67 ± 0,05	0,82 ± 0,10	0,60 ± 0,06
Disability	0,25 ± 0,05	0,16 ± 0,04	0,55 ± 0,06	0,76 ± 0,14	0,53 ± 0,08
Health Group:	2,47 ± 0,20	2,92 ± 0,12	1,83 ± 0,24	2,53 ± 0,61	2,78 ± 0,26
Prophylactic Immunizations	2,00 ± 0,15	3,18 ± 0,69	1,09 ± 0,15	1,59 ± 0,37	1,63 ± 0,18
Infectious and Parasitic Diseases	0,01 ± 0,01	0,15 ± 0,03	0,07 ± 0,03	0,00 ± 0,00	0,07 ± 0,03
Blood and Hematopoietic Organs Diseases	0,08 ± 0,04	0,08 ± 0,02	0,05 ± 0,02	0,06 ± 0,06	0,05 ± 0,03
Endocrine System Diseases	1,54 ± 0,08	0,13 ± 0,03	0,71 ± 0,07	1,29 ± 0,25	0,40 ± 0,08
Psychiatric Disorders	0,37 ± 0,07	0,40 ± 0,04	0,52 ± 0,06	0,65 ± 0,21	0,57 ± 0,07
Nervous System Diseases	1,17 ± 0,07	0,26 ± 0,04	0,51 ± 0,07	0,82 ± 0,29	1,83 ± 0,10
Ocular Diseases	0,16 ± 0,04	0,13 ± 0,03	0,39 ± 0,08	0,88 ± 0,27	1,08 ± 0,12
Diseases of the Circulatory System	0,05 ± 0,02	0,06 ± 0,02	0,05 ± 0,03	0,06 ± 0,06	0,12 ± 0,05
Diseases of the Respiratory System	0,14 ± 0,04	0,09 ± 0,03	0,07 ± 0,03	0,06 ± 0,06	0,12 ± 0,04
Diseases of the Digestive System	0,27 ± 0,06	0,20 ± 0,04	0,38 ± 0,06	1,35 ± 0,38	0,28 ± 0,07
Diseases of the Skin and Subcutaneous Tissue	0,08 ± 0,03	0,08 ± 0,02	0,15 ± 0,04	0,06 ± 0,06	0,07 ± 0,03
Diseases of the Musculoskeletal System	0,13 ± 0,04	0,15 ± 0,03	0,16 ± 0,04	0,65 ± 0,17	0,15 ± 0,05
Diseases of the Genitourinary System	0,04 ± 0,02	0,06 ± 0,02	0,02 ± 0,02	0,18 ± 0,13	0,10 ± 0,05
Congenital Malformations, Deformations and Chromosomal Abnormalities	0,47 ± 0,07	0,33 ± 0,04	2,33 ± 0,06	4,82 ± 0,30	0,48 ± 0,08

The used cluster analysis divided all the 386 children in groups numbering: 83 children in the 1st group; 144 children were allocated to the second group; 82 children – to the third group; 60 children were allocated to the fifth group. The fourth group turned out the smallest and included 17 children. The fourth group children the most often had abnormalities of psychomotor and emotional-vegetative sphere ($0,82 \pm 0,10$) and ($0,82 \pm 0,10$), relatively. In this group, by an average of 100 children, 76 children were disabled ($0,76 \pm 0,14$). Every child of the fourth group had more than 4 types of congenital malformations, deformations and chromosomal abnormalities ($4,82 \pm 0,30$).

With due regard for the peculiarities of each of the 5 groups, it is possible:

1) to chalk out measures for improving the health of the child;

2) to develop a plan for rehabilitative care. Meanwhile, it is necessary to consider the actual results in health indicators children had after a certain time.

References

1. Veltischev Y.E. The concept of risk of disease and health security of the child // Russian Bulletin of Perinatology and Pediatrics. Supplement to the journal. – 1994. – Lecture No. 2. P. 78–83.

2. Ekimov A.K. Modern approaches to the healthcare management // A.K. Ekimov, V.M. Estifeev, N.N. Komarov – Orenburg: OJSC «Publishing and Printing Complex Yuzhny Ural», 2006. – 400 p.

3. Jambu M. Hierarchical cluster analysis and correspondences. – M.: Finance and Statistics. – 1988. – 342 p.

4. Zaks L. Statistical estimation. – M.: Statistics, 1976. – 598 p.

5. Health of children with disabilities: Teaching kit for physicians // ed. Stukalova T.I. – M., 2006. – 382 p.p.

6. Zueva L.P. Epidemiology: Manual / L.P. Zueva, A.Kh. Yafaev. – St. Petersburg: LLC «Publishing House FOLIO», 2005. – 752 p.

7. Morbidity peculiarities in teenage students during their adaptation to higher learning // N. K. Kozhevnikova // Pediatrics. – 2012. – Vol. 91, No. 5. – P. 142–145.

8. Perevoshchikova N.K. The state of health of orphaned children and the possibilities of their rehabilitation in residential care institutions / N.K. Perevoshchikova, E.D. Basmanov, A.L. Aynedinova // Russian Journal of Pediatrics. – 2007. – No. 3. – P. 10–14.

9. Davydova N.O. Level of orphan's health in the concept of critical periods of postnatal ontogenesis / Davydova N.O., Borisova M.A., Notova S.V., Cheremushnikova I.I. // International journal of experimental education. – 2011. – № 12. – P. 3.

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EMERGENCY AND ACUTE MEDICAL CARE: WAYS OF REFORMATION

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The article presents organization forms of acute medical care (AMC) at the basis of a city clinic, amount of AMC work, and an effect of its organization.

There are 3277 stations of emergency medical care operating in the country nowadays. 49,7 millions of calls have been realized, and 51,5 millions of people have been treated "in field" and as ambulatory patients in 2011.

Emergency medical care is the most expensive of all types of medical care. Normative expense per one call (according to the programme of State guarantees for 2011) equaled 1710,1 rubles, while one bed day of hospital treatment cost 478 rubles, and one visit of ambulatory clinic institution cost 218,1 ruble.

In the structure of medical care expenses in Russian Federation 6,7% of all costs refer to emergency medical care, 30,6% – to ambulatory-clinical care, 60,3% – to hospital care, 2,4% refer to hospital-replacing forms.

Since the service of emergency and acute medical care was created, its operation has continuously accumulated a number of problems that have been solved by another reorganization of this institute.

The definition «acute medical care» has been introduced as a conditional indication of the service in order to distinguish it from emergency medical care (EMC). In 1930-ies and 1940-ies provision of emergency medical care to population was delegated to EMC stations, points of home medical care have been organized for patients with diseases that imply no life hazard, they have become known as «acute medical care» (AMC). Consolidation and separation of these to services took place every 10–15 years during following years. At the same time, definitions «emergency» and «acute» medical care have fixed among healthcare organizers and population after more than 80 years.

83% of EMC calls refer to calls to patients with diseases in average and big Russian cities, and only 17% are calls for traumas and accidents [2].

Nowadays a separate organization of emergency and acute medical care is introduced in separate territories of Russian Federation. However, EMC covers all calls from the streets and public places, and also calls from apartments by patients with life-hazardous conditions who require an urgent help of a specialist (suspicion of myocardium infarction, etc.).

The following functions are delegated to AMC: delivering acute medical care to the attached population in case of acute forms and intensifications of chronic diseases; provision of call for emergency medical care according to indications; establishment of succession between district doctors and

specialists; opportune notification of sanitary-epidemiologic service supervision in case of revealed infectious diseases. Organization of separate services of EMC and AMC by polyclinics really provides for its clear succession with ambulatory link [1].

Reformation of emergency and acute medical care cannot take place in separation from regulations of the Concept of healthcare and medical science development that implies training doctors of general practice (family doctors). Transition of initial medical care towards general medical practice should result in decrease in calls of EMC. Development of general medical (family) practices, organization of daytime hospitals, home hospitals, and also dispensary and preventive work will relieve EMC from a lot of unreasonable calls.

City polyclinic № 1 of the city of Samara that treats 59,2 thousands of population, including 50,9 thousands of adults, served as an experimental base of the research on mastering organization forms of separating operations of emergency and acute medical care services. AMC was established in 1998.

Acute medical care of basic polyclinic has three teams, each of them consist of a doctor, medical assistant, and a driver. 3 vehicles are assigned for operation of acute medical care. AMC working hours are from 8 to 24 hours including days-off and holidays. Dispatch service of AMC is located within the structure of polyclinic reception.

The population is informed on the order of calling for AMC. The succession between services of AMC and EMC makes it possible to redirect calls from AMC to EMC and the other way via modem communication.

AMC services are equipped with a bag with a set of necessary medications, needed to deliver urgent care to patients, portative electric cardiograph, defibrillator, set of braces, and tools, required for tracheotomy.

11180 calls from population of basic treatment-preventive institution have been received by AMC service during 4 years of analysis. Frequency of calls for AMC equaled 188,95 per 1000 of population; frequency of calls for EMC equaled 90,3 per 1000 of total population (104,95 per 1000 of adult population). Sum index of frequency of calls for AMC and EMC equaled 279,25 per 1000 of total population. Part of AMC in total number of calls for EMC and AMC equaled 32,3%.

The number of patients, treated by AMC teams increased 1,8 times and equaled 5342 calls during the analyzed period, at the same time, part of calls from the attached population for EMC decreased by 12,5%. It results from the fact that citizens learnt to call of EMC and AMC differentially.

Active visits to patients by AMC teams with indications for EMC equaled 4,3%. Polyclinic doctors (district doctors and doctors of general practice, head doctors in departments, specialists) formed active calls for AMC in order to observe health condition of a patient. The part of such calls equaled

11,1 %, including those directed from district doctors and doctors of general practice – 9,5 %, polyclinic specialists – 1,1 %, head doctors – 0,4 %, home hospital doctors – 0,1 %.

The analysis of EMC calls' results during the studied years has shown that 86,2 % of patients have been left home after the necessary treatment, besides, 7,3 % of the total number of patients who called for EMC, didn't need it and were instructed to visit district doctors and doctors of general practice. 8,7 % of patients who called for EMC, were hospitalized.

The part of hospitalized patients who have been initially served by EMC, decreased from 14,1 to 8,7 %, and it partially it is the result of operational succession between EMC and polyclinic link and activation of preventive work by district doctors and doctors of general practice.

Costs of calling EMC and AMC teams are formed of the following expense entries: salary, charges of direct labour costs, medications and dressing means, economic expenses (including gasoline costs and amortization of equipment), capital repairs, payments for current equipment repairs.

We have established differences that define different costs of calling teams of EMC and AMC. Lower cost of calling AMC team in comparison to EMC calls is formed due to three-shift work regime of AMC teams (16 hr), compared to round-the-clock EMC work regime. Economy on AMC is also achieved via smaller radius of vehicles' mileage (2 times less, compared to the same index for EMC), and lower expenses on medications.

A stable coefficient in relations between EMC and AMC calls' costs has been established for the studied period and equaled 2,56.

These calculations show us that costs of calling general-profile and doctor assistant EMC teams differ insignificantly (relation coefficient equals 1,1), however, there is a significant economic effect of organizing AMC service at the basis of ambulatory-polyclinic institutions, as it is 2,6 times cheaper.

Thus, the suggested organization-functional model of AMC department at the basis of a city polyclinic provides for an efficient utilization of healthcare recourses.

A possibility of differential approach towards organizing services considering special features of a region, service radius, transportation availability, population's age composition, number and structure of calls, location of healthcare institutions, and other conditions while choosing a model of forming them should be preserved.

References

1. Balzamova L.A. Efficiency of using healthcare resources in ambulatory-polyclinic conditions: author's abstract for dissertation of candidate of medical science. – M., 2004. – 26 p.
2. A. Ermolov A report for the board of the Ministry of Healthcare of Russian Federation «Improving organization and development of emergency medical care in Russian Federation». – M., 2002.

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Short Reports

EPIDEMIOLOGY OF MULTIPLE DRUG ALLERGY

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To study the risk factors the questioning of 17 adult patients with multiple drug allergy was held. In examined group we did not find any significant connections between active taking of medicines, occupational harm and health state with development of polysensibilization to drugs. Probably, the development of multiple drug allergy is connected mainly with internal reasons, not external. The only fact – high frequency of thyroid diseases among people with drug allergy may probably be explained with high risk of pseudoallergic reactions in this group, but not with polysensibilization.

Introduction. Phenomena of multiple drug sensitivity is not an exceptionally rare event, but the risk of its development is not studied enough [1–4]. In the territory of ex-USSR self-treatment and polypharmacy are widely developed, which extremely increases the risk of multiple drug allergy [5].

Method. To study the risk factors the questioning of 17 adult patients with multiple drug allergy was held (reaction to 3 and more medicines, without connections in chemical content, with the features of allergy, which is confirmed by allergologist). To compare, 26 patients with multiple drug allergy (clinically significant reaction to one medicine, confirmed by allergologist), addressed in the same period of time. All the patients – women. All the patients do not have any indications of allergy, except drug allergy. Frequency and criterion χ^2 -Pirsonas by using the exact criterion of Fisher.

Results. Group of patients with drug allergy may be characterized as: average age – 44, 7,6% show the father's heredity, 15,3% show the mother's heredity. 34,6% show that in the last 5 years they addressed the doctor with gastro-intestinal diseases (gastritis, pancreatitis), 15,7% say that in the same period they addressed the doctor with cholecystitis, 30,7% are followed up by endocrinologist with the problems of thyroid. In 11,5% of cases they have professional contact with medicines and chemicals. For the question: «Do you think you often used medicines for treatment» 23% answered «yes». Average age of patients with multiple drug allergy was 48 years. Among the questioned 11,7% allergic difficulties was father's heredity, nobody showed the mother's one. 35,2% of patients in the last 5 years addressed to doctor with chronic gastro-intestinal diseases (gastritis, pancreatitis), in 17,6% of cases – with cholecystitis. 7,6% are followed up by endocrinologist ($p \leq 0,05$). In 29,4% of cases patients had

professional contact with medicines and chemicals. На вопрос «Do you think you often used medicines in your life» 47% answered «yes»

Conclusion: In examined group we did not find any significant connections between active taking of medicines, occupational harm and health state with development of polysensibilization to drugs. Probably, the development of multiple drug allergy is connected mainly with internal reasons, not external. The only fact – high frequency of thyroid diseases among people with drug allergy may probably be explained with high risk of pseudoallergic reactions in this group, but not with polysensibilization.

References

1. Asero R. Multiple drug allergy syndrome: a distinct clinical entity. *Current Allergy Reports*. – 2001. – № 1. – P. 18–22.
2. Gex-Collet C., Helbling A., Pichler Multiple W.J. Drug Hypersensitivity -proof of multiple drug hypersensitivity by patch and lymphocyte transformation tests *J Invest Allergol. Clin. Immunol.* – 2005. – Vol. 15(4). – P. 293–296.
3. Macy E, Ho NJ. Multiple drug intolerance syndrome: prevalence, clinical characteristics, and management. *Ann Allergy Asthma Immunol.* – 2012 Feb, 108(2). – Epub 2011, Dec 9, 88–93.
4. Anahita Falakshahi Dioun Management of Multiple Drug Allergies in Children *Curr. Allergy Asthma Rep.* – 2012. – № 12. – P. 79–84.
5. Akhmaltdinova L., Starikova S. Epidemiology of drug allergy *Immunopathology, Allergology, Infectology*. – 2011. – № 4. – P. 44.

PROBLEMS AND PROSPECTS OF MEDICAL REHABILITATION DEVELOPMENT IN KAZAKHSTAN

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Universal health deterioration of the population, the growth of primary disease and the chronization of diseases caused the increased demand for medical rehabilitation.

Medical rehabilitation care in the RK is relatively young and is in need of highly qualified personnel, regulation of staff standards for medical rehabilitation specialists, development of approaches to the estimation and planning of the number of medical rehabilitation personnel.

Currently rehabilitation of sick and disabled people is one of the priority directions in medicine that helps to return millions of sick and disabled people to the sphere of socially useful life.

Traumatism, congenital and acquired musculoskeletal diseases, heart attacks and strokes are important problem in modern healthcare due to the high level of prevalence, temporary and permanent disability and mortality of the population [1–2].

The number of disabled persons in Kazakhstan as of January 1, 2011 is 563.1 thousands people, including 45,8 thousands disabled children (Statistical Abstract. Astana, 2012).

60% of deaths in developed countries are shared by myocardial infarction and stroke. Up to a quarter of those patients die within the first month after the onset of disease, and up to 30% – within the first year. The percent of full recovery is not more than 20% of the survived.

According to the WHO, the aggregate value of direct and indirect costs per one stroke patient is 55–73 thousands US dollars, accounting for about 4–5% of total health expenditure. Indirect costs related, for example, with job losses, cannot be calculated and considerably exceed expenses [3].

A new «Medical Recreation Therapy, Rehabilitation Treatment» discipline specialization (Health Ministry of the Republic of Kazakhstan Order № 774 dated 24.11.2009) was implemented in 2009 in Kazakhstan and joined together physical therapists and doctors in exercise therapy and balneology. Unification of these disciplines is based on common approaches to disease prevention aimed at correcting functional and adaptive capabilities of the body by comprehensive and differentiated use of non-pharmacological technologies for restoration and compensation of impaired functions of sick and disabled people.

Departments or courses of Medical Rehabilitation were opened in all medical universities of the Republic and joined pre-existing Department of Exercise and Physical Therapy. Currently, trainees in this discipline are doctors who pass CME and retraining cycles. This situation has developed due to the fact that hours of Medical Rehabilitation were not provided in the SCES-2009 and this important discipline became an elective. Thus, Kazakh «new generation» graduates, finishing higher education institution, practically don't know even basics of physical therapy, exercise therapy, balneology and, especially, medical rehabilitation.

The first set of residents – medical rehabilitation specialists has started since 2010–2011, specialists training and retraining in medical rehabilitation is taught in parallel at the faculties of post-graduate education. New rehabilitation centers are opened in the country, including on the basis of state-private partnership, the program for stroke centers construction is approved.

At the same time, the lack of qualified professionals among medical rehabilitation specialists remains an important issue to implement the principles of medical rehabilitation: early start, phasing, continuation, continuity, complexity and individual approach. There are only 373 medical rehabilitation

specialists now in the RK (2,2 per 100 thousand population), including 230 certified physiotherapists, 60 – doctor of exercise therapy, and only 83 certified as medical rehabilitation specialists (Record form № 30 for administrative data collection, 2012).

Medical rehabilitation has been recognized around the world and supported by the state and national health systems. More than 13 thousands professionals in the field of physical therapy and rehabilitation medicine worked in Europe in 2007. Rehabilitation was officially recognized in Sweden in 1969, in Scotland – 1975, in Great Britain – 1989, and received the official status in the USA in 1947. Historical sketch presented in the works of F. Yunusov et al. (2004) suggests that medical rehabilitation was officially recognized in Europe in the 60–70th years of the last century [4].

F. Yunusov et al. (2004) notes that back in 1947 the American Board of Medical Specialties recognized physical medicine and rehabilitation as an independent field of medicine. The only difference is that in the USA this field of medicine is called «physiatrics», and doctors of this specialization – «physiatrist» [5]. In the world practice, physiotherapists and doctors in exercise therapy are combined by the term «physical therapist».

The forms of rehabilitation are various in different countries, but the goals and challenges facing them are the same.

The main goal of medical rehabilitation is to achieve full recovery of disturbed due to illness or injury, or if it is impossible – the optimum realization of physical, mental and social potential of the disabled person, his most adequate integration in society (WHO Expert Committee, 2008).

Implementation of this area indicates the need to regulate staff standards for medical rehabilitation specialists, to develop approaches to the estimation and planning of the number of medical rehabilitation personnel.

Analysis of the existing regulations (Health Ministry of the Republic of Kazakhstan Order № 238 dated 7.04.2010, № 774 dated 24.11.2009, Record Form № 30), which define the staff structure of health institutions, revealed a number of discrepancies in the regulation of the work of medical rehabilitation specialists and interpretations of the regulatory language. Thus, the definitions of doctors in Physical Therapy and Exercise Therapy are still different, but according to the approved nomenclature of medical specialties, there is a specialty Medical Rehabilitation, but there are no specialties Physical Therapy and Exercise Therapy.

Time limits for patients are developed separately for physiotherapist and for doctors in Exercise Therapy. Thus, according to the Health Ministry of the Republic of Kazakhstan Order № 238, recommended time for exercise therapy doctor consultation per one patient is insufficient (15 minutes), because only one functional test needs 10–20 minutes. 15 minutes

for each different body part massage won't allow to achieve the desired therapeutic effect.

Time for physiotherapeutic procedures carrying out is given without any justification. For example, 4 minutes are specified for magnetic therapy while the software of new physiotherapeutic equipment, intensively supplied to the health institutions of Kazakhstan, includes the range of time for this procedure from 6 to 20 minutes.

This situation doesn't promote efficiency of medical rehabilitation, especially according to the developed Standard of the organization of rehabilitation care which provides for the introduction of unified criteria to assess functional disorders in respect of patients with cardiac, neurological and musculoskeletal pathologies.

In this regard we offer the following ways to optimize medical rehabilitation care in Kazakhstan:

1. To define functional responsibilities for rehabilitation specialist.
2. To optimize the regulatory framework to calculate the staff and workload for professionals engaged in rehabilitation and recovery treatment.
3. To develop staff standards for adult rehabilitation centers due to the stroke centers construction and setting into operation in all regions of the country.
4. To align time limits for physiotherapeutic procedures taking into account continuously improving health technologies and software requirements of equipment.
5. The issues of the organization of medical rehabilitation are closely related with training. In different countries, training of medical rehabilitation specialists is different: in some countries is differentiated by narrow specialties due to the opening of medical rehabilitation offices and centers for specific patient contingents, in other countries – students' education is based on the integrated training in rehabilitation methods in combination with preven-

tive and curative aspects. This approach is designed to encourage all doctors to carry out rehabilitation as an integral part of their daily work (non-specialized approach).

Medical rehabilitation along with other medical disciplines should be included in medical universities' and colleges' curriculum at least in the form of an integrated training, binary seminars for all clinical disciplines with involvement of the Medical Rehabilitation Departments faculty to deliver sections related to the rehabilitation of patients with different pathology.

6. To modernize educational process for all clinical specialties: to introduce the integrated training in medical rehabilitation and recovery treatment of patients with the relevant nosologies.

Rehabilitation should be early and continuous, complex and individual, start with the first minutes of patient health encounter. This approach requires knowledge and skills of rehabilitation by physicians of all specialties.

In this regard, advanced training of «narrow» specialists on early medical rehabilitation in their specialty without getting primary specialization in medical rehabilitation should be permitted, and these hours (credits) should be taken into account at assigning qualification category.

References

1. Volkova T.A. Condition and ways of optimisation of inpatient help to trauma patients at rural area // Autoreferat of Candidate of Medical Science dissertation: 14.00.33 – Public Health and Healthcare. – St.-Petersburg, 2006. – 18p.
2. World Healthcare Statistics, 2012. WHO, Geneva. – 180 p. Complete version: www.who.int/healthinfo/EN_WHS2012_Full.pdf.
3. Chalmers J. Volhard Lecture. Brain, blood pressure and stroke // J Hypertens. – 1998. – 16 (12 Pt 2). – P. 1849–1858.
4. Yunusov F.A. Organisation of medical-social rehabilitation abroad / F.A. Yunusov, G. Gaiger, E. Mikus. – M.: All-Russian Social Foundation «Social Development of Russia», 2004. – 310 p.

CHEMICAL COMPOSITION AND ANTIFUNGAL ACTIVITY OF ESSENTIAL OILS OBTAINED FROM ABIES SIBIRICA L., GROWING IN THE REPUBLIC OF KAZAKHSTAN

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Basing on the analysis of literature it was revealed that a comprehensive study of etheric-oil plants, essential oils and search for ways of their new applications in various sectors of the economy are not only urgent in this century, but are also acquiring a special importance, scientific and practical significance. Among coniferous attar plants the most widely spread in the Republic of Kazakhstan is *Abies sibirica* L., which grows in the East Kazakhstan region, mountain forests of the Altai, the Tarbagatai and the Dzhungarsky Alatau. The aim of this work is the comparative research of the component composition of the essential oils samples obtained by means of steam distillation and microwave heating from *Abies sibirica* L., collected in the Altai mountain forests of the East Kazakhstan region, and their antifungal activity towards *Candida albicans*.

Keywords: essential oils, microwave heating, antifungal activity

Basing on the analysis of literature it was revealed that a comprehensive study of etheric-oil plants, essential oils and search for ways of their new applications in various sectors of the economy are not only urgent in this century, but are also acquiring a special importance, scientific and practical significance [1]. Among coniferous attar plants the most widely spread in the Republic of Kazakhstan is *Abies sibirica* L., which grows in the East Kazakhstan region, mountain forests of the Altai, the Tarbagatai and the Dzhungarsky Alatau [2–3].

Many authors [works 4–11] have studied the component compositions of the essential oils, obtained by different methods from *Abies sibirica* L. But their works do not fully represent the component composition of the essential oil obtained from *Abies sibirica* L. by microwave heating. Antimicrobial activity of the fir oils obtained by steam distillation is also represented [works 12–17], but antifungal activity of the essential oil of *Abies sibirica* L. obtained by microwave heating has not been studied.

The Objective. The aim of this work is the comparative research of the component composition of the essential oils samples obtained by means of steam distillation and microwave heating from *Abies sibirica* L., collected in the Altai mountain forests of the East Kazakhstan region, and their antifungal activity towards *Candida albicans*.

The Object and Methods. The raw material was analyzed fresh. To avoid destruction of biologically active substances and to remove excess moisture it was dried immediately after gathering. [18]. Samples of the essential oils of *Abies sibirica* L. were obtained by methods of steam distillation and microwave heating in a «STARTE Microwave Extraction System» device.

Qualitative and quantitative analyses of the essential oils samples composition were

performed with an «Agilent Technologies 7890A GC System, 7683B Series Injector, 5975C VL MSD with Triple-Axis Detector» device. To identify the components the library of NIST 02 and Willey mass spectra was used. Table represents the component structure of the fir essential oil of *Abies sibirica* L., obtained by microwave heating.

For the study of the antifungal activity of the essential oils of *Abies sibirica* L. reference strains of *Candida albicans* were received from the laboratory of the Department of Infectious Diseases and Microbiology of the Veterinary and Pharmaceutical University in Brno, Czech Republic. Oils samples were dissolved in DMSO and 0,9% saline solution. After dissolution the essential oils samples were placed into 96-well flat microplates [19–21].

For the testing the fungal inoculum was resuspended with a multichannel pipette to achieve a final volume of 100 micro liters. The highest concentration of the oil solution is 256 mkg/ml. 5-Flucytosine (1 mkg/ml) was included as a positive control. *Candida albicans* growth was monitored by measuring the optical density at 600 nm in a microplate reader (BMG, reader Labtech, Germany) at 37°C from 0 to 48 hours. The monitoring conducted within 48 hours showed that the essential oil of *Abies sibirica* L., obtained by means of microwave heating, has the highest antifungal activity next to the positive control 5-Flucytosine. (Figure).

The antifungal activity of the essential oils of *Abies sibirica* L., obtained by means of steam distillation (sample WM) and microwave heating (sample MW), was determined with a «SPECTRO star Omega» device. The results of the study are shown below in Figure.

Chemical composition of the essential oil of *Abies sibirica* L., obtained by microwave heating

Composition	R _t	%	Composition	R _t	%
Santene	9,05	5,63	Bornylacetate	31,12	34,26
Tricyclene	9,87	1,57	β -Caryophyllene	31,76	0,57
α -Pinene	10,46	10,03	Unknown with Mr 204	33,25	0,27
Camphene	12,26	18,16	Unknown with Mr 204	33,58	0,05
β -Pinene	13,90	1,34	α -Caryophyllene	33,97	0,31
3-Carene	15,57	8,98	Borneol	34,56	1,87
β -Myrcene	16,10	0,56	Unknown with Mr 204	35,15	0,14
Limonene	17,55	2,73	γ -Cadinene	35,43	0,81
β -Phellandrene	17,94	2,54	Geranyl acetate	36,04	0,32
γ -Terpinene	19,35	0,17	L-Cadinene	36,38	0,24
p-Cymene	20,33	0,09	1,4-Cadinadiene	37,18	0,05
Terpinolene	20,56	0,05	Calamenene	38,59	0,07
Terpinolene	20,78	1,35	Unknown with Mr 207	39,89	0,10
4-Isopropenyltoluene	26,31	0,09	Unknown with Mr 220	41,26	0,17
α -Cubebene	26,97	0,26	1-Dodecanol	41,59	0,21
α -Longipinene	27,49	0,03	Caryophyllene oxide	42,82	0,09
Copaene	27,93	0,03	Nerolidol	43,51	0,06
α -Cubebene	28,24	0,24	α -Bisabolol	48,04	0,85
Camphora	29,18	0,74	Scarlene	51,13	0,10
Unknown with Mr 204	29,53	0,08	Epimanol oxide	51,61	0,65
β -Cubebene	29,72	0,18	Epimanol oxide	52,00	0,39
6-Camphenol	30,12	0,16	Dehydroabietine	54,25	0,13
Unknown with Mr 204	30,18	0,16	Manool	57,99	3,25

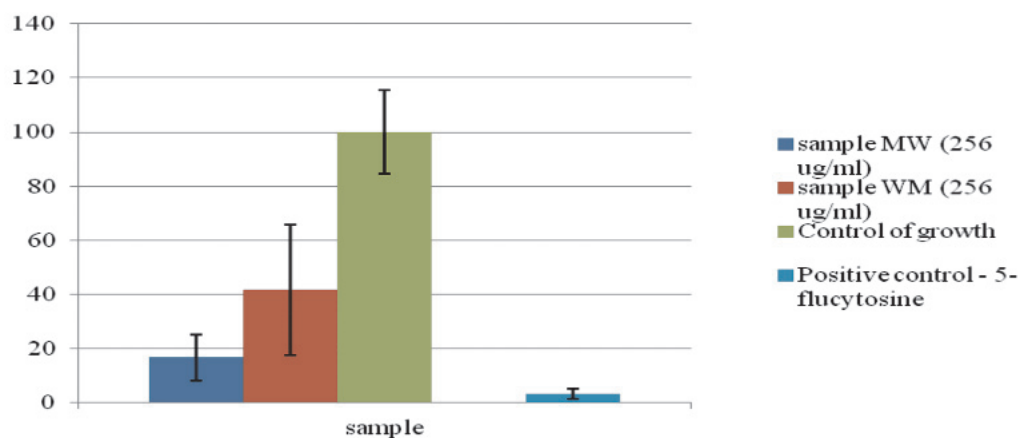
Notes:

Injector: T_{inj} : 250°C, Pressure 66,224 kPa, Septum purge flow 3 ml/min, Total flow 16,385, split 1:10.

Oven: Toven 40°C, 4 min, 4°C/min, 260°C, 4 min hold time, 63 final time, He, vacuum compensation ON, solvent delay time 4 min, equilibration time 0,25 min, max. oven temp. 300°C.

Detector: MS, Scan 29–650 m/z, Scans/second 1,22, Trans.line to MS 280°C, MS source 230°C, MS Quad 150°C.

Colu Column: Thermo Scientific P/N 260X296P, S/N 12967C07, TR-WAXMS, Length 30 m 0,25 mm I.D., 1,0 μ m film ticknes, 40°C, 66,224 kPa, 1,2168 ml/min, 40 cm/s, constant flow.



Antifungal activity of essential oils of *Abies sibirica* L.

Conclusions

1. Comparison of the data above with the available data on the chemical composition of the essential oil of *Abies sibirica* L., obtained by steam distillation, shows that the essential oil of *Abies sibirica* L., obtained by microwave heating, has a richer component composition. Bornyl acetate content of this oil is 34,26 %.

2. Thus, our studies of the essential oils of *Abies sibirica* L. have revealed dependence of the oils properties on the ways the oils are obtained: the essential oil of *Abies sibirica* L., obtained by microwave heating, has a richer component composition and displays a higher antifungal activity towards *Candida albicans* than that one obtained by means of steam distillation.

References

1. Tkachenko K.G., Vest. Udmurt University. – 2011. – № 1. – P. 88–100.
2. ru.wikipedia.org / wiki.
3. Fir forests of the Kazakhstani Altai. Leninogorskaya Pravda. – 2013. – № 6/8.
4. Pankiv O.G., Miroshnichenko V.V., Parshikova V.N., Stepen R.A., Chem.plants. s. – 2009. – P. 95–98.
5. Strukova E.G., Efremov A.A., Gontova A.A., Sokolova L.S. Chem.plants. s. – 2009. – P. 73–82.
6. Efremov E.A., Efremov A.A. Him.rast. s. – 2010. – P. 135–138.
7. Tkachenko K.G., Kazarinova N.V., Muzychenko L.M. Rast.res. – 1999. – № 33. – P. 11–23.
8. Karmanova L.P., Kuchin A.V., Kuchin V.A. Chem. and chem. those. – 2005. – Vol. 48. – № 2.
9. Efremov A.A., Golubev S.V., Zykov I.D. Materials of IV All-Russian conference. Barnaul. – 2009. – P. 113–115.
10. Hasanov V.V., Ryzhova G.L., Kuryaeva T.T., Dychko K.A., Him.rast. s. – 2009. – P. 83–88.
11. Shutova A.G., Spiridovich E.V., Garanovich I.M., Senkevich G.G., Kurchenko V.P. Works of the Belarusian State University. – Minsk, 2008. – Vol. 3. – P. 1–16.
12. Andri P., Pierre-Luc L., Maxime L., Jean L. Phytother. Res. – 2006. – № 20. – P. 371–373.
13. Filipowicz N., Kaminski M., Kurlenda J., Asztemborska M., Ochocka J.R. Phytother.Res. – 2003. – № 17. – P. 227–231.
14. Hong E.J., Na K.J., Choi I.G., Choi K.C., Jeung E.B., Biol. Pharm. Bull. – 2004. – № 27. – P. 863–866.
15. Kizil M., Kizil G., Yavuz M., Aytekin P., Appl. Biochem. Microbiol. – 2002. – № 38. – P. 144.
16. Pichette A., Larouche P. L., Lebrun M., Legault J., Phytother. Res. – 2006. – № 20. – P. 371.
17. Vishnoi S.P., Ghosh A.K., Debnath B., Samanta S., Gayen S., Jha T., Fitoterapia. – 2007. – № 78. – P. 153.
18. Rules of gathering and drying herbs. – M., 1985. – P. 321.
19. Banfi E., Scialino G., Monti-Bragadin J.C. Antimicrob. Chemother. – 2003. – № 52. – P. 796–800.
20. Espinel-Ingroff F., Boyle K., Sheehan D.J. // Mycopathologia. – 2001. – Vol. 150. – P. 101–115.
21. Rex J.H., Pfaller M.A., Galgiani J.N., Bartlet M.S., Espinel-Ingroff A., Ghannoum M.A., Lancaster M., Odds F.C., Rinaldi M.G., Walsh T.J., Barry A.L. // Clin.Infect. Dis. – 1997. – Vol. 24. – № 2. – P. 248–249.

MONITORING FORMATION OF SOLID INDUSTRIAL WASTE AND ITS RECYCLING IN A FOREST COMPLEX

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The articles studies problems of formation and secondary facilitation of solid industrial wastes, reveals types of wastes that are produced at the territory of Krasnoyarsk region, and outlines the most significant types for recycling.

Keywords: solid wastes, recycling, Krasnoyarsk region

Exploitation of ecological potential of natural systems isn't traditionally included into the system of nature management, however, clean air, water, products of nutrition are the same natural recourse, it is widely spread at certain territories, and it is rare at different ones, and is also exhaustible, just as any other recourse. Is bearer is the nature's ability to self-recover. The greater is an ecosystem's stability potential, the more clean air, water, and nutrition is available to human.

In order to limit unreasonable destruction of nature's potential, it is necessary to maximize convergence between indexes of financial-economic efficiency and ecological safety of any types of activity. Initial possibility of such combination is linked to a high correlation between indexes of economic efficiency of lands and their stability that exist in such conditions of natural ecosystems, it allows one to use land and rent taxes for ecologic purpose. The system of differentiating land tax rates by the state, Federation subjects, and city municipalities that considers not only agrarian-industrial and infrastructural, but also ecological criterions, will provide for shrink of areas, occupied by producers, mainly due to refusal to use low-efficient or unequipped territories. At the same time a land and its ecosystems obtain a real significance for all categories of managers. Anthropogenic impact of human is unfavourable for the environment. The goal of this research is to give an evaluation of ecological potential of Russia and human impact upon the environment. This topic is urgent, as the problem of healthy existence of a person is faced at the modern stage of social development. Basic sources of polluting urbanized territories are industrial wastes that form as a result of productive process. Wastes of industry have a negative impact upon almost all components of the environment.

Development of recycling allows us to increase volumes of secondary raw materials, used on a territory, decrease costs of burning and burying wastes of production and consumption, increase power intensity of economy, increase investment attraction, decrease threat towards population health, create new

jobs, decrease pollution of regional ecosystems, improve aesthetic condition of territories – all these possibilities allow us to consider recycling as one of important tools of solving ecological-economic problems, urgency of which increase with greater rates than efficiency of the implemented measures does.

During any industrial production solid industrial wastes (SIW) are formed inevitably. Some enterprises use SIW partially in adjacent or basic productions, and they might not be used at all. Thus, accumulation of SIW of different types and conditions takes place inevitably at enterprises, and they need to be utilized – burnt, buried, or taken to a fill. Over 340 million of industrial waste of different types and classes of hazard are produced at the territory of Krasnodar region annually. Basically, the established volumes are buries, and, of course, it has an effect upon the ecological situation in the region. Most utilization grounds do not correspond to modern international norms and rules.

According to statistic data of observing industrial wastes and their consumption, provided by the Administration of federal service of observing in the area of natural usage in Krasnodar region, types of solid industrial wastes that are discharged at the region territory in 2011, have been defined. Danger class of industrial wastes that is defined according to requirements of hygienic and radioactive safety, has been considered while revealing wastes [1].

In order to estimate recycling ability of the selected SIW, indexes that define an ability of secondary use, have been defined for each type of wastes. Such in dexes are: coefficient of for mingrelations K_b and criterion parameter of quality K_c that depends on means and conditions of preparing waste for further processing. In order to analyze relations between these indexes and reveal the most recycle-efficient wastes, we have implemented the method of ranging correlation [2].

The results of ranking SIW of Angaro-Enisey region according to coefficients of forming relations K_b and criterion parameters of quality K_c are presented in Table 1.

Table 1

Results of ranking SIW

Number	Waste type	K_b	K_c	Ranks of variable indexes		Differences between ranks	
	i	y_i	x_i	w_i	v_i	$(v_i - w_i)$	$(v_i - w_i)^2$
1	Wood chips	0,99	85	1	4	3	9
2	Sawdust	0,96	87	2	3	1	1
3	Crust	0,9	90	3	1,5	-1,5	2,25
4	Vermiculite	0,82	90	4	1,5	-2,5	6,25
5	Glass	0,8	80	5,5	6	0,5	0,25
6	Plastics	0,8	72	5,5	7	1,5	2,25
7	Polyethylene terephthalate	0,75	81	7	5	-2	4
8	Rubber-technical products	0,7	65	8	9	1	1
9	Wooden slag	0,67	58	9	10	1	1
10	Coal slag	0,6	67	10	8	-2	4
11	Garbage burning slag	0,33	23	11	11	0	0
12	Haydite waste	0,31	18	12	15	3	9
13	Gypsum waste	0,3	20	13	13	0	0
14	Chamotte brick breaking	0,22	20	14	13	-1	1
15	Wastes of solid polystyrene	0,2	20	16	13	-3	9
16	Coke dust	0,2	15	16	16,5	0,5	0,25
17	Crushed stone of non-consumable shape	0,2	5	16	19,5	3,5	12,25
18	Textile	0,17	5	18	19,5	1,5	2,25
19	Wastes of processing ore and raw materials	0,16	15	19	16,5	-2,5	6,25
20	Mineral sludge	0,15	10	20	18	-2	4
Sum	–	–	210	210	0	75	

According to the data, presented by Table 1, we shall calculate ranking correlation coefficient of Spearman:

$$r_s = 1 - \frac{6 \cdot 75}{20^3 - 20} = 0,944.$$

The received coefficient of ranking correlation nears +1, and it testifies on a close relation between the coefficient of forming relations and criterion parameter of quality. Therefore, using these indexes to evaluate recycling possibility is reasonable.

In order to recycle SIW at the territory of Krasnodar region and in Angaro-Enisey district specifically, it is necessary to define, what types of waste can be used as secondary raw materials according to criteria of efficiency and ecologic safety. To solve this problem, we have implemented the method of ranking correlation with usage of Spearman coefficient and revealed types of SIW that can be used with no damage for human health by an output product [3].

Let us imagine a certain type of product, received with usage of SIW as a function of healthy characteristics of product components B_{pr} on types of waste, used while producing the

given product. This functional dependence in normalized values of the factor looks as:

$$y = f(x_{11}, x_{12}, x_{13}, x_{14}, x_{15}, x_{16}, x_{17}, x_{18}, x_{19}, x_{110}).$$

In natural values of the factor it looks as:

$$B_{pr} = f(C, W_c, W_f, G, P_t, P, S_c, S_w, R, V).$$

Table 2 presents the studied factors, waste types, and their sum volumes according to enterprises.

According to the provided correlation analysis with usage of ranking correlation coefficient of Spearman and the selection of solid industrial wastes, estimation of their recycling efficiency, we suggest measures that explain what types of SIW can be used in certain industries in order to receive certain products. It is possible to receive slabby materials with increased characteristics of solidity in case of breaking polyethylene terephthalate to definite granulometric composition and adding it into the contents of slabby production in range of 10 to 40%. Thus, producing fibreboard of 2,5 mm thickness with addition of 10–20% of polyethylene terephthalate will increase the board solidity to 75–90 MPa. Thus, it is possible to set up an output of slabby and block

materials with increased indexes of solidity in case of implementing polyethylene terephthalate wastes without great investments.

It has been established that bass and crust, processed together via method of dry breaking to a certain granulometric composition and warming the received mass up to a definite temperature, one can receive a glue substance. Using the received composition in

production of firebreboard makes it possible to produce plates of solidity characteristics, set by GOST, and also decrease wood material consumption, plates' costs and toxicity while preserving physical-mechanic characteristics of the product. At the same time, plates' appearance remains the same, and the problem of utilizing significant reserves of crust is solved.

Table 2

Initial matrix for statistic-mathematical analysis of SIW

Number	Waste type			Waste volume		
	Natural values	Normalized values		Natural values	Normalized values	
1	C	Crust	x_{11}	89929,24	V_1	x_{21}
2	W_c	Wood chips	x_{12}	1286889,07	V_2	x_{22}
3	W_f	Sawdust	x_{13}	589138,58	V_3	x_{23}
4	G	Glass	x_{14}	423,64	V_4	x_{24}
5	P_t	Polyethylene terephthalate	x_{15}	1452,13	V_5	x_{25}
6	P	Plastics	x_{16}	622,77	V_6	x_{26}
7	S_c	Coal slag	x_{17}	650117,83	V_7	x_{27}
8	S_w	Wooden slag	x_{18}	3217,17	V_8	x_{28}
9	R	Rubber-technical products	x_{19}	615,76	V_9	x_{29}
10	V	Vermiculite	x_{110}	290018,88	V_{10}	x_{210}

Thus, without breaking technological process, it is possible to set up an output of plate products, construction and finishing materials of special purpose that possess some additional characteristics at enterprises. It will allow one to increase productive powers of enterprises, decrease consumption of raw materials, cut costs while preserving physical-mathematic characteristics of products, broaden realization markets also due to western-European customers, increase product quality, decrease material and energetic costs of production. These meas-

ures can help improve the region's ecology significantly due to utilizing wastes.

References

1. Official web-site of the management of federal supervision service in the area of nature usage of Krasnodar region. – URL: <http://www.yarsknadzor.ru>.
2. Eldestein Y.M. Modeling and optimizing productive processes in wood processing industry: textbook. – Krasnoyarsk, 2003. – 103 p.
3. Pizhurin A.A. Basics of scientific research in wood-working: textbook for institutions of higher education. – M., 2005. – 305 p.

Materials of Conferences

FORMULATION OF BUSINESS GAMES FOR TRAINING AND RETRAINING OF INDUSTRIAL ENTERPRISES

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Introduction. The organizational and technological level of modern industrial enterprises is largely determined by the creation and application of effective mechanisms for the formation and implementation of strategic plans for the development and effectiveness of the operational management of all production, logistics and organizational processes that aim to achieve high profitability, development and improvement of production. Therefore, the construction of the organizational structure of enterprise management is a complex multi-level problem [1–15]. Principles and methods of the construction of organizational management structure are directly dependent on many factors. The most significant of these are the specifics of the particular production process the set of technological processes used, production volume, productive capacities used, tactical, technical and quality parameters of the products, the issues of standardization and certification, the qualification level of technical, administrative and management personnel, the management system utilized, the regulatory and legal framework of the enterprise and the organization of internal and external documents. The task of building the organizational structure in an industrial environments a high-priority task in relation to other problems of industrial process control. Formulation and solution of this problem at a high scientific and technical level is a prerequisite for the effective organization of production, the output of highly competitive products, the growth of financial and economic indicators, dynamic development and continuous improvement of production.

The relevance of the topic is determined by the need to optimize the organizational structure of the enterprise management as the problem of the «upper level» to be the priority decisions as a basic component of a successful and efficient operation of any industrial enterprise, regardless of the type of products and production capacity.

Formulation of the business game framework

The main part of the business simulation game (BSG) includes a simulation model of the environment, the virtual game participants and interaction algorithms between these models and real trainees [1–15]. The BSG body is constructed out of parallel strings of arbitrary algorithmic complexity, one for each party involved in the BSG. The data separa-

tion describing the current status of each role type with in this role limits is carried out by means of the fragment, and not at the assembly level of the BSG framework in the structural elements designer.

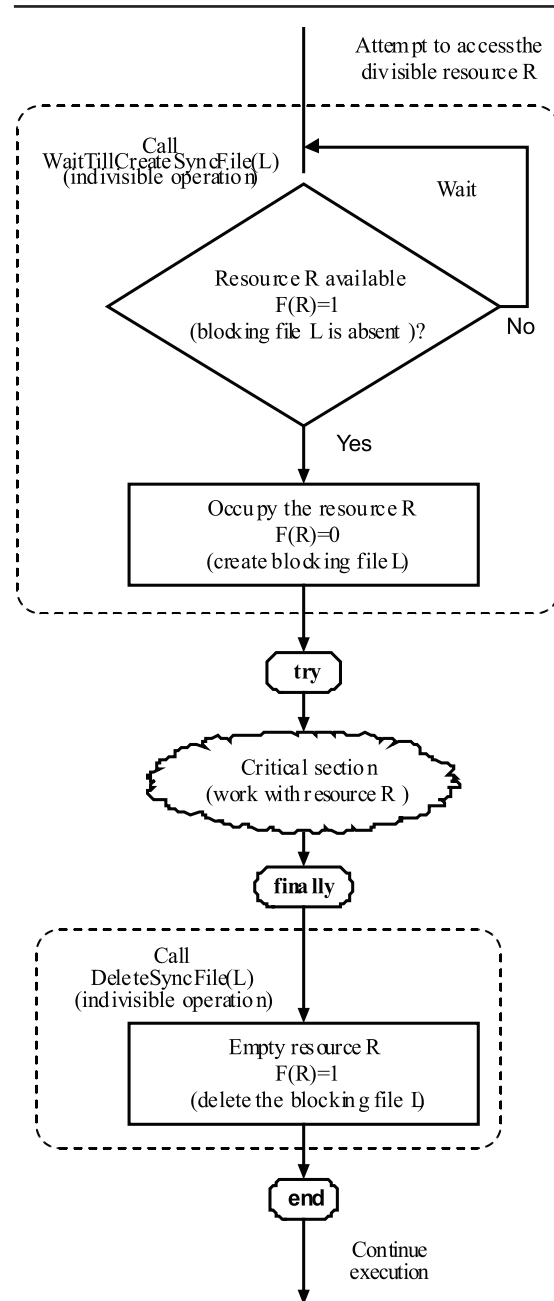


Fig. 1. Mechanism of critical sections based on the blocking variables

The mechanism is similar to critical sections based on the blocking thread when synchronizing the variables in a single process (Fig. 1) [3, 5–8].

To ensure the synchronization process in the local network, the zero-size file is used as a blocking variable. The presence of the file indicates that the resource is busy, while its absence shows that the resource is available.

The BSG frame consists of a set of fragments combined into a scenario generated according to the algorithm. The scenario is assembled in a struc-

tural elements designer. The framework is intended to form the organizational and structural environment of the BSG as players register in the BSG and its subsequent dissolution when the player leaves the game. For the user, execution fragments of the frame look like a step-by-step wizard, where he/she can terminate the registration process or return to the previous step at any moment (Fig. 2).

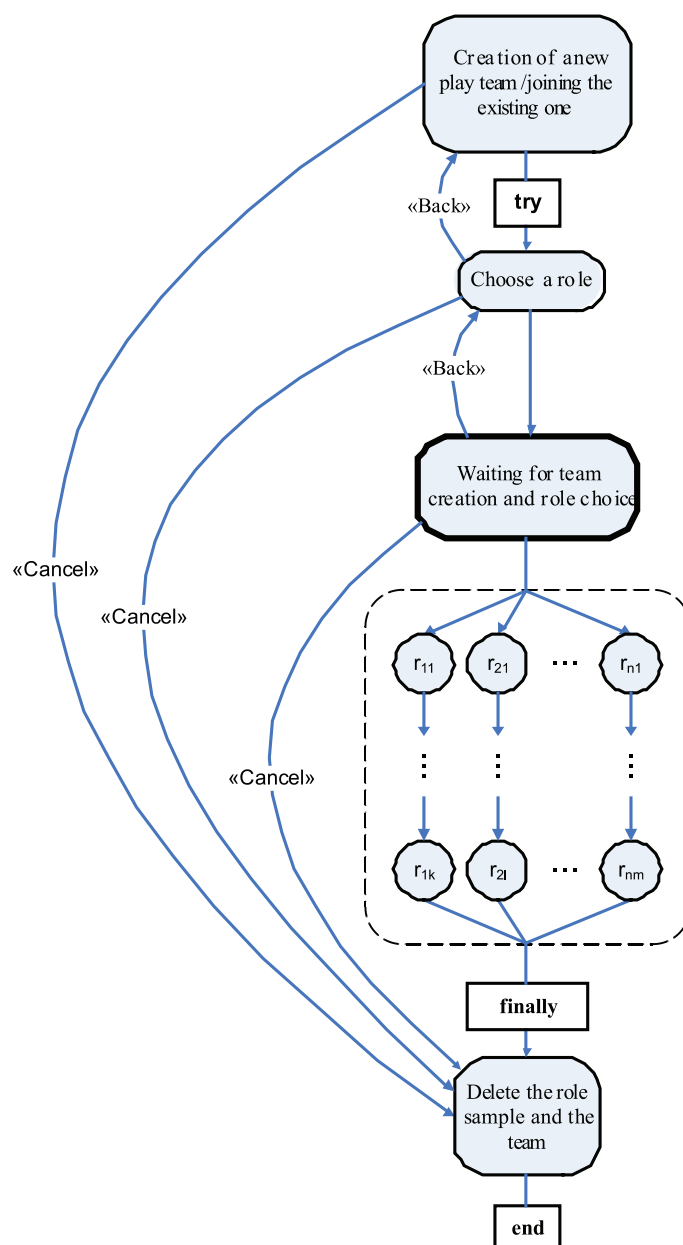


Fig. 2. Schematics of the BSG frame work

Fig. 2 legend: r_{ij} – fragments that implement the scenario-i-throle; **try ... finally ... end** – exceptions handling at the level of the BSG scenario; it provides guaranteed performance of de-initializing fragment of the frame.

Some fragments constituting the frame are visual and are intended for visual organization of the User Interface during the registration of the player in the BSG. Other fragments are no visual and are designed to perform as a support for the operation of the BSG frame.

It is possible to organize the parallel execution of the processes within a given game set to reduce the delays associated with performing lengthy operations (e.g. being in the waiting regime). In this case, the non-visual (auxiliary) process will run in the background. The main thread of the scenario and auxiliary processes can interact (communicate) and sync. Background processes can also interact with each other.

The formulation of the technological processes in terms of Petri nets

Most of the operations of the technological process share resources. Execution of the operations is partly synchronous and partly asynchronous. Hence, in addition to the above description, a model describing processes in the form of Petri nets is suggested [3, 5–8]. These network models of the processes are the basis for the description and the scenario execution of an interactive simulation model (IMU). They allow to check whether the framework is correct, to identify the presence of dead ends and blockages in its description; as well as to identify possible options for further development of the simulated technological process at an early stage while training the personnel and in the process of simulation itself.

There are additional restrictions for a given type of Petri nets:

A4. $\forall \chi, \gamma \in XP \cup T: \chi F^+ \gamma \Rightarrow \neg(\gamma F^+ \chi)$ if $\chi \neq \gamma$, that is relation F^+ (transitory closure of F) is not symmetric and the network does not contain loops.

A5. $H(N) \neq \emptyset \wedge \forall \chi \in X, \forall D^{-1}(\chi): D^{-1}(\chi)$ is finite. This limitation requires that any net work representing the process should not have an on-empty set of main places and does not contain, in-finite paths.

A6. $\forall t \in T: \bullet t \neq \emptyset \wedge t^{\bullet} \neq \emptyset$, that is any transition has at least one entrance and one exit.

$$A7. \forall p \in P: M_0(p) = \begin{cases} 1, & \text{if } p \in H(N), \\ 0 & \text{otherwise} \end{cases}$$

Such net work processes have a standard initial layout where only head-points contain one token.

Let's consider the net works shown in Fig. 3. It is clear that the description of this particular BSG scenario fragment, simulating the processing of incoming complaints, has several disadvantages. If transition `time_out_1` and `processing_2` or transition `time_out_2` and `processing_1` are executed, then the final result of the network performance will be incorrect, because the token will remain in the position `c5` or `c4`. If transition `time_out_1` and `time_out_2` are executed then the `processing_NOK` operation will be performed twice and because there are two tokens in the position `o` the time of completion is unclear.

In this work we show that the process description should meet the following criteria:

- 1) Network has entrance position i (initial condition) and exit position o (final condition);
- 2) Each operation/condition is located on the path from i to o .
- 3) For any sample of technological process the performance of the network should have an end and at the end point the chip is at the position o and all the other positions are empty;
- 4) There should be no dead-end operations in the net work. That is it should be possible to perform any type of task at the corresponding path of the Petri net describing the technological process modelled in the simulation game.

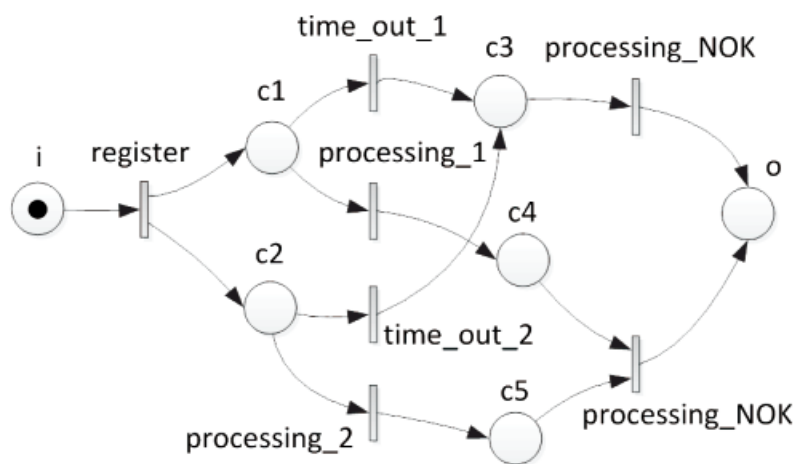


Fig. 3. Petri net for processing the incoming complaints

Fulfilment of the first two criteria can be checked by using methods of statistical analysis, that is they exclusively have to do with the struc-

ture of the Petri network. The other two additional limitations correspond to the so-called property of defect lessness of the network.

A process modelled by the Petri net $PN = (P, T, F)$ is considered defect free iff

1) For each state M reachable from the state i there is a sequence of execution of transitions leading from the state M to state o . Formally

$$\forall_M (i \xrightarrow{*} M) \Rightarrow (M \xrightarrow{*} o)$$

(Here symbol I denotes both the position I and the state with the only token at the position i)

2) State o is the only reachable state from the state i with at least one token at the state o .

Formally,

$$\forall_M (i \xrightarrow{*} M \wedge M \geq o) \Rightarrow (M = o).$$

3) There are no dead-end transitions in (PN, i) .

Formally,

$$\forall_{t \in T} \exists_{M, M'} i \xrightarrow{*} M \xrightarrow{t} M'.$$

The property of defect lessness corresponds to the dynamic behaviour of the net describing the technological process and can be used for the analysis of their correctness in the composition of the BSG scenarios.

The above-given description of the Petri net allows us to investigate the topology of the BSG scenario, to find loops and dead ends. In addition, the matrix description of the resulting Petri nets can find invariants of the network, which allows us to solve the problem of finding all the variants of the simulated process in the course of an educative game with the use of the simulation game.

Conclusion

In conclusion, the principles of the scenario construction and instruments of the BSG were developed. We proposed network models of the technological processes that form the basis of the description of the interactive simulation scenario and allow us to check the correctness of the scenario, to see the presence of dead-ends and blocks in its description. Also they allow us to identify possible options of the development of the simulated technological process at the early stages of the game.

It was shown that it is possible to transform formal description schemes of the technological processes into a multipart BSG scenario automatically similar to the usage of the critical sections based on the blocking variables during the syncing of the flows of a single process.

References

1. Barinov K.A. Implementing the innovative multimedia methodological complexes in the learning process. Opytned renijainno vacionnyhmul' time dijnyh uchebno-metodicheskikh kompleksov v uchebnyj process / K.A. Barinov, A.V. Ostrouh, M.N. Krasnyanski, P.S. Rozhin, N.E. Surkova // Vestnik MADI (GTU), issue 1 (8) / MADI (GTU). – M., 2007. – P. 89–94.
2. Barinov K.A. Implementation of the business games in computer-based learning systems / K.A. Barinov, A.V. Ostrouh, N.E. Surkova // Open and distance learning, № 3 (27), Tomsk state university 2007. – P. 28–33.
3. Barinov K.A. Development and testing of electronic educational resources of new generation distance learning / K.A. Barinov D.A. Burov, M.N. Krasnyanski, A.V. Ostrouh // Nauchnyjvestnik MGTU-GA, issue № 141 / MGTU GA. – M., 2009. – pp. 181–188.
4. Barinov K.A. Development of role playing games for training and re-training of the production plant and transportation of industry personnel / K.A. Barinov A.V. Bugaev, D.A. Burov, A.V. Ostrouh // Nauchnyjvestnik MGTU GA, issue № 141 / MGTU GA. – M., 2009. – P. 189 Opytned renijainno vacionnyhmul' 197.
5. Barinov K.A. Virtual training complexes for the training of the chemical and Virtual'nye trenazhernye komplekсы dlja obuchenija i treninga personalah imicheskimi mechanical engineering industries / K.A. Barinov D.L. Dedov, M.N. Krasnyanski, A.V. Ostrouh, A.A. Rudnev // Vestnik TGTU. Volume 17. № 2. – Tambov, 2010. – P. 497 Opytned renijainno vacionnyhmul' 501.
6. Barinov K.A. Formation of the organizational management structure of the production plant using multipart business games. / K.A. Barinov, A.B. Vlasov, V.Yu. Stroganov, G.G. Yagudaev // Science and Education. Moscow State Technical University named after N. E. Bauman. Electronic magazine 2011. № 8. Online access: <http://technomag.edu.ru/doc/206805.html> (connection date 27.09.2013).
7. Barinov K.A. Correlation between the educational plan modules. / K.A. Barinov O.B. Rogova, D.V. Stroganov // The world of Scientific discoveries, issue № 9 (21) / Scientific Research Center – Krasnoyarsk, 2011. – P. 28–34.
8. Barinov K.A. Intellectualization of the test controls in the open education / K.A. Barinov, L.V. Ivanova, E.Yu. Tolkaev, G.G. Yagudaev // The world of Scientific discoveries, issue № 9 (21) / Scientific Research Center – Krasnoyarsk, 2011. – P. 86–92.
9. Barinov K.A. Methods and algorithms of adaptive computer-based testing / K.A. Barinov Kartashev M.I. // The world of Scientific discoveries, issue № 9 (21) / Scientific Research Center – Krasnoyarsk, 2011. – P. 93–106.
10. Barinov K.A. Quality evaluation of the heterogeneous testing / K.A. Barinov L.V. Ivanova, K.A. Nikolaeva // The world of Scientific discoveries, issue № 9 (21) / Scientific Research Center – Krasnoyarsk, 2011. – P. 126–130.
11. Barinov K.A. Algorithm of the virtual training complex for re-training of petrochemical company personnel / K.A. Barinov, M.N. Krasnyanski, A.Yu. Malamut, A.V. Ostrouh, G.G. Yagudaev // The world of Scientific discoveries, issue № 2.6 (26) / Scientific Research Center – Krasnoyarsk, 2012. – P. 168–174.
12. Barinov K.A. Application of the module-competentive approach in development of electronic educational resources for an e-learning system of professional education institution / K.A. Barinov A.V. Ostroukh // Engineering Competencies – Traditions and Innovations. Proceedings, 37-th International IGIP Symposium 2008. – Moscow, Russia, 7-10 September, 2008. – C. 253–254.
13. Barinov K.A. Algorithm of the Virtual Training Complex Designing for Personnel Retraining on Petrochemical Enterprise / K.A. Barinov M.N. Krasnyanskiy, A.J. Malamut, A.V. Ostroukh // International Journal of Advanced Studies 2, № 3 (2012). Online access: http://journal-s.org/index.php/ijas/article/view/201236/pdf_13 (connection date 27.09.2013).

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COMPUTER SCENARIOS OF BUSINESS GAMES FOR PERSONNEL TRAINING AT INDUSTRIAL ENTERPRISES

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Introduction. The organizational and technological level of modern industrial enterprises is largely determined by the creation and application of effective mechanisms for the formation and implementation of strategic plans for the development and effectiveness of the operational management of all production, logistics and organizational processes that aim to achieve high profitability, development and improvement of production. Therefore, the construction of the organizational structure of enterprise management is a complex multi-level problem [1–15]. Principles and methods of the construction of organizational management structure are directly dependent on many factors. The most significant of these are the specifics of the particular production process the set of technological processes used, production volume, productive capacities used, tactical, technical and quality parameters of the products, the issues of standardization and certification, the qualification level of technical, administrative and management personnel, the management system utilized, the regulatory and legal framework of the enterprise and the organization of

internal and external documents. The task of building the organizational structure in an industrial environment is a high-priority task in relation to other problems of industrial process control. Formulation and solution of this problem at a high scientific and technical level is a prerequisite for the effective organization of production, the output of highly competitive products, the growth of financial and economic indicators, dynamic development and continuous improvement of production.

The relevance of the topic is determined by the need to optimize the organizational structure of the enterprise management as the problem of the «upperlevel» to be the priority decisions as a basic component of a successful and efficient operation of any industrial enterprise, regardless of the type of products and production capacity.

Formation mechanisms of the business game scenarios

Let's consider the mechanisms of the formation of scenarios that have software support in the workbench «SOTA». The general case of organizational and structural medium of multirole BSG is shown in Fig. 1, where

G – multirole business game (MBG);

R_j – roles in G ; $1 \leq j \leq N_R$, where N_R – number of roles in G ;

g_i – samples of G ; $1 \leq i \leq N_g$, где N_g – number of samples of G ;

r_{ijk} – samples of roles in the samples of G ; $1 \leq i \leq N_g, 1 \leq j \leq N_R, k \leq N_{Rj}$, where N_{Rj} – number of samples of the role R_j .

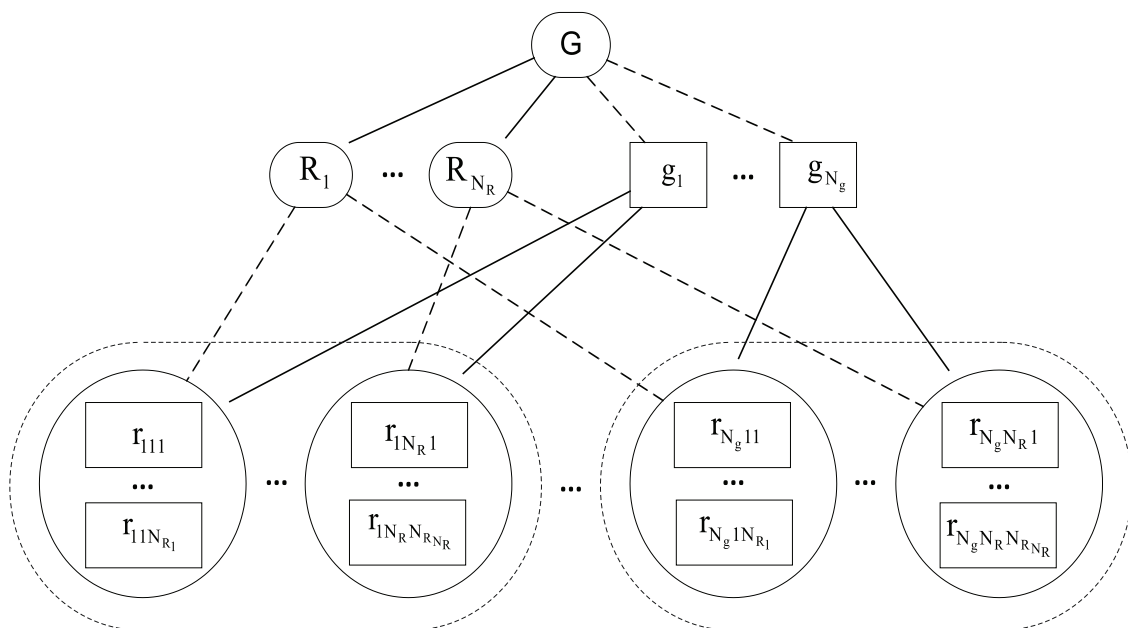


Fig. 1. General case of the organizational structure of the multipart BSG environment

The structure of the individual single-sample BSG which has the possibility to create several interconnected samples of its single role is analogous to the individual BSG with the only sample of this role but supporting several interacting samples of the game

[1, 2, 6, 8]. Broken lines indicate the class-sample relationships. Arrows indicate relationships of belonging. Various versions of the organization of the management flow are possible when developing the body of BSG (Fig. 2). Octagons denote syncing fragments.

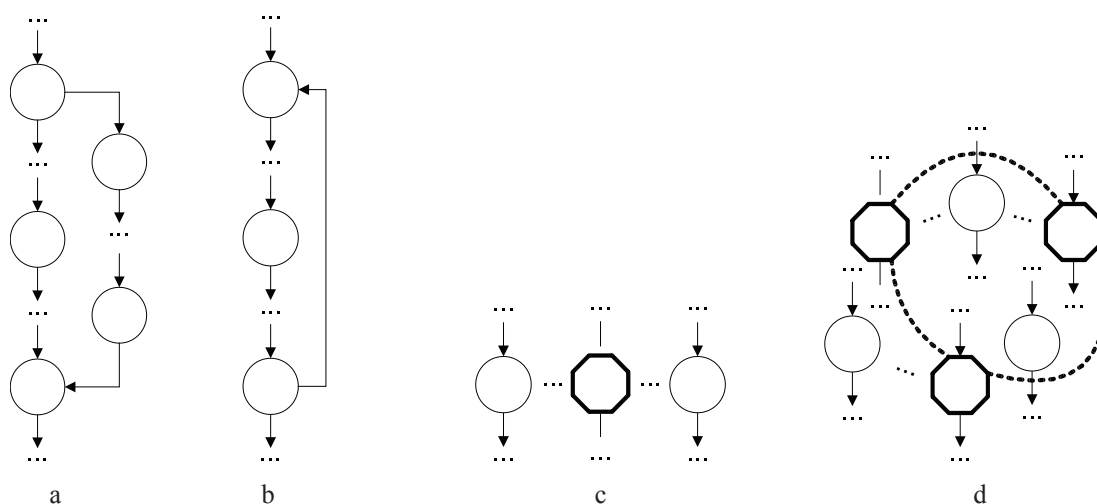


Fig. 2. Options of the flow control

Performance of the BSG frame is defined by the following parameters (their values are set during the developmental stage of the game): whether it is single or multipart; there is limitation in the choice of roles.

Schematically, the process of creating a new multirole BSG on the basis of the framework and using the developed tools can be represented by the diagram on Fig. 3. Typically, the BSG scenario then consists of the main part and auxiliary part.

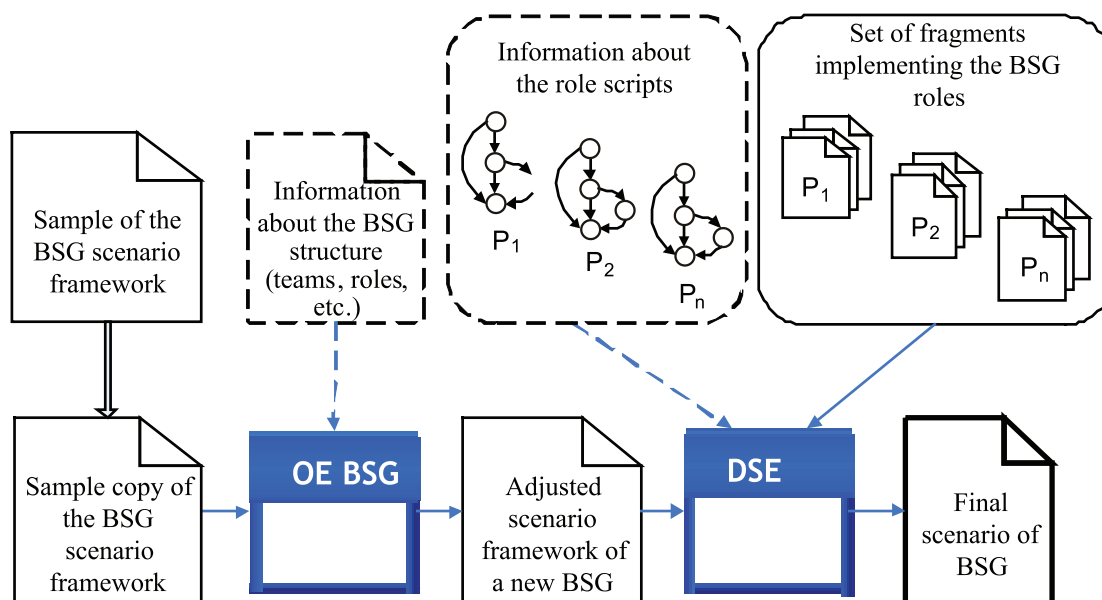


Fig. 3. New BSG creation process

The auxiliary part represents a universal frame work that implements initialization and de-initialization functions common to a large class

of BSGs. These functions are preparatory for the formation of the organizational structure of the BSG in accordance with limitations introduced

at the developmental stage and are responsible for the dissolution of the BSG. The organizational and structural environment created during the BSG forms as a result of registration of participants of the game.

The BSG framework consists of the following four elements:

• *Initialization part:*

1) F_1 – creation of the new BSG sample (new gaming group) or choosing the existing one (choosing the group);

2) F_2 – choosing a role from the list of roles provided in the BSG, creation of the sample (joining the group in the quality defined by the chosen role);

3) F_3 – waiting for the selection of the other compulsory available roles (the number for each role has a predefined number of samples) by the remaining participants of the game. Any participant registered in the given sample of the game can initiate the game if the conditions below are satisfied:

a) There are BSG roles assuming an arbitrary number of samples;

b) All the compulsory roles with the predefined number of samples are occupied in all the current BSG samples.

If a new participant of the game started registering in at least one of the samples of the BSG and has not finished the registration yet, the initiation of the game can temporarily be blocked even if all the above-mentioned conditions are met. Once all the participants are registered the game can be initiated by any of the participants. This fragment of the game is syncs the game.

• *De-initialization part:*

1) F_4 – completion of the role sample. If this was the last incomplete sample of the role among all the

samples of roles connected to the given sample of BSG then the completion of this BSG sample takes place. This fragment of the game is non-visual.

Formal approach to the automation of the business game development process

The proposed principles of BSG can partially automate the process of developing new games. This can be done through the usage of a quick scenario assembling designers, parameter adjustment of the template frame of the BSG, storing of the most commonly executed fragment sand their re-use, the availability of means to integrate with mathematical packages – the latter can be used to realize particular aspects of a scenario.

It is possible to estimate the qualifications of the personnel based on the results of the game on the basis of the proposed interactive gaming model. It allows the calculation of the time required to make decisions regarding the management of the production processes.

This work solves the distribution of the personnel and assignment of a particular task problem directed at improving the time parameters of the technological process through variation of the number and time characteristics of human resources in the simulation model associated with each operation in the technological process.

Thus, the random elements a_{ij} of the matrix of responses A are indicative of the successful execution of the task at the j th level of BSG by the i th participant, that is

$$a_{ij} = \begin{cases} 1, & \text{if the solution is correct} \\ 0, & \text{if it is not} \end{cases}. \quad (1)$$

Probabilities of possible values of a_{ij} in the main logistical Rasch model are described by the success function

$$p_{ij} = p\{a_{ij} | (\Theta_i, \delta_j)\} = \exp[a_{ij}(\Theta_i - \delta_j)] \cdot [1 + \exp(\Theta_i - \delta_j)]^{-1}, \quad (2)$$

where the level of readiness Θ_i of the i the participant and the complexity level δ_j of the task j are parameters which can be evaluated; $i = 1, 2, \dots, n$; $j = 1, 2, \dots, k$.

The likelihood function L of a discrete random variable a_{ij} is a function of the arguments Θ_i, δ_j as the product of the probabilities (2) for all possible values of i and j :

$$L(a_{ij}; \Theta_i, \delta_j) = \prod_{i=1}^n \prod_{j=1}^k p\{a_{ij} | \Theta_i, \delta_j\} = \exp\left[\sum_{i=1}^n \sum_{j=1}^k a_{ij}(\Theta_i - \delta_j)\right] \left[\prod_{i=1}^n \prod_{j=1}^k (1 + \exp(\Theta_i - \delta_j))\right]^{-1}. \quad (3)$$

The values of latent parameters $\hat{\Theta}_i, \hat{\delta}_j$ at which the likelihood function (3) reaches the maximum (we are talking about the global maximum and not the local one here) are taken as the point estimate of the latent parameters. These estimates

of $\hat{\Theta}_i$ and $\hat{\delta}_j$ are called the highest likelihood estimates.

Since the functions L and $\ln L$ reach a maximum at the same values of their arguments, instead of looking for the maximum of L , one can look for the maximum of the log-likelihood function $\ln L$

$$\ln L = \sum_{i=1}^n b_i \Theta_i - \sum_{j=1}^k c_j \delta_j - \sum_{i=1}^n \sum_{j=1}^k \ln[1 + \exp(\Theta_i - \delta_j)], \quad (4)$$

where $\sum_{i=1}^n i = 1a_{ij} = c_j$;

$$\sum_{j=1}^k a_{ij} = b_i \quad (5)$$

are initial scores of the participants and levels of BSG respectively.

It has been shown that the log-likelihood function depends on the primary scores b_i and c_j only,

$$\begin{aligned} \frac{\partial \ln L}{\partial \Theta_i} &\equiv b_i - \sum_{j=1}^k \frac{\exp(\Theta_i - \delta_j)}{1 + \exp(\Theta_i - \delta_j)} \equiv b_i - \sum_{j=1}^k p_{ij} = 0; \quad i = 1, 2, \dots, n; \\ \frac{\partial \ln L}{\partial \delta_j} &\equiv -c_j + \sum_{i=1}^n \frac{\exp(\Theta_i - \delta_j)}{1 + \exp(\Theta_i - \delta_j)} \equiv c_j + \sum_{i=1}^n p_{ij} = 0; \quad j = 1, 2, \dots, k. \end{aligned} \quad (6)$$

The system of equations (6) represents a system of equations of likelihood. It is nonlinear and contains $n + k$ equations with $n + k$ unknown latent parameters $\Theta_1, \dots, \Theta_n, \delta_1, \dots, \delta_k$.

This work demonstrates that the system (6) has only one solution which corresponds to the maximum of log-likelihood function.

Conclusion

In conclusion, the principles of the scenario construction and instruments of the BSG were developed. We proposed network models of the technological processes that form the basis of the description of the interactive simulation scenario and allow us to check the correctness of the scenario, to see the presence of dead-ends and blocks in its description. Also they allow us to identify possible options of the development of the simulated technological process at the early stages of the game.

It was shown that it is possible to transform formal description schemes of the technological processes into a multipart BSG scenario automatically similar to the usage of the critical sections based on the blocking variables during the syncing of the flows of a single process.

References

1. Barinov K.A. Implementing the innovative multimedia methodological complexes in the learning process. Opytnyye reniainno vacionnyhmul' time diynyhuchebno-metodicheskikh kompleksov v uchebnyj process / K.A. Barinov, A.V. Ostrouh, M.N. Krasnyanski, P.S. Rozhin, N.E. Surkova // Vestnik MADI (GTU), issue 1 (8) / MADI (GTU). – M., 2007. – P. 89–94.
2. Barinov K.A. Implementation of the business games in computer-based learning systems / K.A. Barinov, A.V. Ostrouh, N.E. Surkova // Open and distance learning, № 3 (27), Tomsk state university 2007. – P. 28–33.
3. Barinov K.A. Development and testing of electronic educational resources of new generation distance learning / K.A. Barinov, D.A. Burov, M.N. Krasnyanski, A.V. Ostrouh // Nauchnyjvestnik MGTU-GA, issue № 141 / MGTU GA. – M., 2009. – P. 181–188.
4. Barinov K.A. Development of role playing games for training and re-training of the production plant and transportation of industry personnel / K.A. Barinov A.V. Bugaev, D.A. Burov, A.V. Ostrouh // Nauchnyjvestnik MGTU GA, issue № 141 / MGTU GA. – M., 2009. – P. 189–197.
5. Barinov K.A. Virtual training complexes for the training of the chemical and Virtual' nye trenazhernye komplekсы dlja obuchenija i treninga personalahim icheskihi mechanical engineeringindustries / K.A. BarinovD.L. Dedov, M.N. Krasnyanski, A.V. Ostrouh, A.A. Rudnev // Vestnik TGTU. Volume 17. № 2. – Tambov, 2010. – P. 497–501.
6. Barinov K.A. Formation of the organizational management structure of the production plant using multipart business games. / K.A. BarinovA.B. Vlasov, V.Yu. Stroganov, G.G. Yagudaev // Science and Education. Moscow State Technical University named after N.E. Bauman. Electronic magazine 2011. № 8. Online access: <http://technomag.edu.ru/doc/206805.html> (connection date 27.09.2013).
7. Barinov K.A. Application of business game tools to the problems of the management of production in the highly competitive environment / K.A. Barinov ,A.A. Solncev, P.A. Timofeev, V.M. Rachkovskaya // Science and Education. Moscow State Technical University named after N.E. Bauman. Electronic magazine 2011. № 9. Online access: <http://technomag.edu.ru/doc/207618.html> (connection date 27.09.2013).
8. Barinov K.A. Formal models of representation and organization of business games / K.A. Barinov B.S. Goryachkin, L.V. Ivanova, A.B. Nikolaev // Moscow State Technical University named after N.E. Bauman. Electronic magazine 2011. № 9. Online access: <http://technomag.edu.ru/doc/207391.html> (connection date 27.09.2013).
9. Barinov K.A. Correlation between the educational plan modules. / K.A. Barinov O.B. Rogova, D.V. Stroganov // The world of Scientific discoveries, issue № 9 (21) / Scientific Research Center – Krasnoyarsk, 2011. – P. 28–34.
10. Barinov K.A. Intellectualization of the test controls in the open education / K.A. Barinov L.V. Ivanova, E.Yu. Tolkaev, G.G. Yagudaev // The world of Scientific discoveries, issue № 9 (21) / Scientific Research Center – Krasnoyarsk, 2011. – P. 86–92.
11. Barinov K.A. Methods and algorithms of adaptive computer-based testing / K.A. Barinov Kartashev M.I. // The world of Scientific discoveries, issue № 9 (21) / Scientific Research Center – Krasnoyarsk, 2011. – P. 93–106.
12. Barinov K.A. Quality evaluation of the heterogeneous testing / K.A. Barinov, L.V. Ivanova, K.A. Nikolaeva // The world of Scientific discoveries, issue № 9 (21) / Scientific Research Center – Krasnoyarsk, 2011. – P. 126–130.
13. Barinov K.A. Algorithm of the virtual training complex for re-training of petrochemical company personnel / K.A. Barinov, M.N. Krasnyanski, A.Yu. Malamut, A.V. Ostrouh, G.G. Yagudaev // The world of Scientific discoveries, issue № 2.6 (26) / Scientific Research Center – Krasnoyarsk, 2012. – P. 168–174.
14. Barinov K.A. Application of the module-competitive approach in development of electronic educational resources for an e-learning system of professional education institution / K.A. Barinov A.V. Ostroukh // Engineering Competencies – Traditions and Innovations. Proceedings, 37th International IGIP Symposium 2008. – Moscow, Russia, 7–10 September, 2008. – C. 253–254.
15. Barinov K.A. Algorithm of the Virtual Training Complex Designing for Personnel Retraining on Petrochemical Enterprise / K.A. Barinov M.N. Krasnyanskiy, A.J. Malamut,

A.V. Ostroukh // International Journal of Advanced Studies 2, № 3 (2012). Online access: http://journal-s.org/index.php/ijas/article/view/201236/pdf_13 (connection date 27.09.2013).

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SECURITY SCANNERS

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The directions in the field of information security, as an adaptive network security were considered. This directions are composed of two major technologies – security analysis (security assessment) and the detection of attacks (intrusion detection). And the subject of the paper will be the first technology aforesaid.

Introduction. The network consists of channels, nodes, servers, workstations, application and system software, databases, etc. All of these components need to be evaluated for their protection effectiveness. Means tested network security analysis and look for «weak» place in it, analyze the results and based on them create various reports. In some systems, instead of «manual» intervention by the administrator, some vulnerability that found will be eliminated automatically (for example, in the System Scanner). Here are some of the problems identified by the analysis of security systems:

- ✓ «hatches» in the programs (back door) and programs such as «Trojan horse»;
- ✓ weak passwords;
- ✓ susceptibility to penetration of unprotected systems;
- ✓ improperly configured firewalls, Web – servers and databases;
- ✓ etc.

Technology of security analysis is an effective method of implementing network security policies before implementing its attempt to breach the inside or outside of the organization.

The modalities of the work

There are two basic mechanisms by which the scanner checks for vulnerabilities – Scan (scan) and probing (probe) [1].

Scanning – the mechanism of passive analysis, in which the scanner is trying to determine the presence of vulnerabilities without actual confirmation of its presence – on circumstantial evidence. This method is fast and simple to implement. In terms of ISS, this method is called «inference» (inference). According to Cisco this process identifies open ports found on every network device and collects associated with ports headers (banner), found by scanning each port. Each received header is com-

pared with table rules of network devices, operating systems and potential vulnerabilities. On the basis of this comparison are made the conclusion about the presence or absence of vulnerabilities.

Probing – active mechanism analysis, which ensures presence or absence vulnerability on the analyzed node. Probing performed by simulating the attack, using the validated vulnerability. This method is slower than the «scan», but almost always much more accurate. In terms of ISS, this method is called «confirmation» (verification). According to Cisco's process uses information obtained during the scanning process («inference»), for a detailed analysis of each network device. This process also uses well-known methods of the attacks in order to fully confirm the alleged vulnerability and discover other vulnerabilities that cannot be detected by passive methods, such as susceptibility to attacks such as «denial of service».

In practice, these mechanisms are implemented by several following methods.

«Checking the headlines» (banner check).

This mechanism is a series of tests such as «Scan» and allows you to make a conclusion about the vulnerability of relying on the information in the request header scanner. A typical example of such a test – analysis of program headers Sendmail or FTP-server that allows you to find out their version and use that information to draw a conclusion about the presence of these vulnerabilities.

«Active probing test» (active probing check).

Also related to the mechanism of «scanning». However, they are not based on checking the software version in the headlines and on the comparison of the «digital snapshot» (fingerprint) piece of software with a cast of well-known vulnerabilities. Likewise as antiviral system, comparing the scanned fragments software virus signatures that are stored in a dedicated database. A variation of this method are the check sums or the date of scanning software, which are implemented in scanners running on the operating system level.

«Imitation of attacks» (exploit check).

These checks include the mechanism of «probing» and is based on the exploitation of various defects in the software.

Some vulnerabilities do not reveal themselves until you «push» them. For that purpose against a suspect or service node they run a real attack. Header checks carried out initial inspection of the network, and the method of «exploit check», rejecting the information in the headers to simulate a real attack, thereby more effectively (but less speedy) detecting vulnerability scanning nodes. Imitation of attacks is a more reliable method of analysis of security than the header checks, and usually more reliable than active probing test [2].

However, there are cases where the simulated attack cannot always be realized. Such cases can be divided into two categories: a situation in which the test results in a «denial of service» of the analyzed

host or network, and the situations in which a vulnerability in principle, is suitable for the implementation of network attacks.

The scanning steps

Almost any scanner analyzes the security in several stages:

1. Collecting the network information. At this stage identified all active devices on your network and determined by running them services and daemons. In the case of systems security analysis at the level of the operating system, this step is skipped, since at each node of the analyzed system are set to relevant agents scanner.

2. Detection of potential vulnerabilities. The scanner uses the above database to compare the data collected from known vulnerabilities by checking the headers or active probing inspections. In some systems, all vulnerabilities are ranked according to the degree of risk. For example, in NetSonar vulnerabilities are divided into two classes: local and network vulnerability. Network vulnerability (for example, acting on routers) is considered more serious than vulnerabilities unique to workstations. Similarly, «comes» and Internet Scanner. All of the vulnerabilities in it are divided into three levels of risk: High, Medium and Low.

3. Confirmation of selected vulnerabilities. The scanner uses special methods and models (mimics) certain attacks to confirm the existence of vulnerabilities on the selected nodes of the network.

4. Report generation. Based on the collected data, the system creates a security analysis reports describing discovered vulnerabilities. In some systems (eg, Internet Scanner and NetSonar) reports are generated for different types of users, ranging from network administrators and ending with the leadership of the company. If the first is primarily interested in the technical details, it is necessary to guide the company to present a beautifully decorated with the use of graphs and charts reports with a minimum of detail. An important aspect is the presence of recommendations to address the identified problems. And here on the right is the leader of the system Internet Scanner, which for each vulnerability contains step by step instructions to resolve the vulnerabilities that are specific to each operating system. In many cases, the reports also contain links to the FTP-server or Web-based, containing patches and hot fixes, resolves vulnerability.

5. Automatic elimination of vulnerabilities. This stage is very rarely realized in network scanners, but is widely used in the system scanners (eg, System Scanner). Furthermore, this feature can be implemented in different ways. For example, the System Scanner, a special script (fix script), which the administrator can start to address the vulnerability. Along with the creation of this scenario is created and the second scenario, cancelling the changes. This is necessary if the problem is corrected; the normal functioning of the assembly had been vio-

lated. In other systems, the possibility of «rolling back» does not exist.

In any case, the administrator performing the search for vulnerabilities, there are several options for using the system security analysis:

- Start scan only for checking potential vulnerabilities (stages 1, 2 and 4). This gives a preliminary acquaintance with the systems in the network. This method is much less disruptive than others and also is the fastest.

- Start Scan for checking potential and confirmed vulnerability. This method can cause a disruption of the network nodes during the execution of audits type «exploit check».

- Start scanning with your custom rules for finding a particular problem.

- All the aforementioned

A single database format of vulnerabilities

In order to standardize and possible integration of security analysis is currently underway to create a common format for all scanners database vulnerabilities. Although this work has only just begun and it is far from being completed, the first steps have already been taken. For example, COAST Laboratory at Purdue University has developed a draft of such a database. One of the problems encountered by the researchers – a description of vulnerabilities and their controls (attacks) [4].

Languages of the description vulnerabilities and checks

Attempts to add mechanisms for describing vulnerabilities and checks in the system security analysis were carried out for a long time. They were made by almost all software companies. The first such attempt was made by Wits Venema and Dan Farmer – developers of SATAN. Description of new vulnerabilities or rather their checks carried out by means of language Perl. This is a rather trivial task required extensive knowledge of language Perl, and the architecture of the protocol stack TCP / IP and scan the operating system. The same path (using Perl) system developers went Web Trends Security Analyzer. Annex 1 provides an example of checks to determine the type of operating system being scanned host. Language Perl, along with the language C, and is used in the Internet Scanner. Moreover, in addition to features built into the system Internet Scanner, ISS delivers a separate company description system attacks APX (Advanced Packets eXchange).

Conclusion

Use of such funds is necessary. But I want to note that we should not regard them as a panacea for all ills. They do not in any way replace the security specialists. They just automate their work in helping to quickly check hundreds of nodes, including and those on other sites. They will help to detect virtually all known vulnerabilities and recommend measures to eliminate them. They automate the process, and with the ability to describe their own checks, will help to effectively apply them to any

organization's network, taking into account your particular specificity. We must remember that the scanner – it's just a part of the effective network security policy, which consists not only of the use

of various technical measures of protection (security analysis tools, intrusion detection systems, firewalls, etc.), but also the use of various organizational and legislative measures.

Appendix 1.

Example audit carried system Web Trends Security Analyzer

```
<TestAuthor> WebTrends Corporation </TestAuthor>
```

```
<TestCopyright> Copyright 1998, WebTrends Corporation, All Rights Reserved. </TestCopyright>
```

```
<TestVersion> 2.0 </TestVersion>
```

```
<TestDependency> estabvc </TestDependency>
```

```
<TestCategory> inventory </TestCategory>
```

```
<TestTitle> Query OS Type via Netbios </TestTitle>
```

```
<TestVulnerabilityDescription>
```

This test attempts to determine the operating system type and version running on the specified hosts.

```
</TestVulnerabilityDescription>
```

```
<Test>
```

```
# osdetectnt.pl
```

```
# attempt to detect OS using a netbios over tcp/ip call
```

```
require "crowbar.pl";
```

```
$theTargetNetbiosName=GetStringParam($crowbar::WTDB_NetbiosName);
```

```
crowbar::WTDebugOutput("OSDetect -- the target netbios name is $theTargetNetbiosName");
```

```
if($theTargetNetbiosName){$a=crowbar::WTGetNTOSInfo($theTargetNetbiosName);
```

```
if($a){$a=~ /^OSTYPE (.*) :VERSION (.*)/;$type=$1;$version=$2;
```

```
crowbar::WTDebugOutput("Type is $type, version is $version\n");if($version=~ m/OSVersion_Unknown/){crowbar::WTAddRecord($crowbar::WTDB_OSVersion, length("Unknown") + 1, "Unknown", -1);} elseif($version=~ m/OSVersion_WindowsNT_3_5_0/){crowbar::WTAddRecord($crowbar::WTDB_OSVersion, length("Version 3.5") + 1, "Version 3.5", -1);}elseif($version=~ m/OSVersion_WindowsNT_3_5_1/){crowbar::WTAddRecord($crowbar::WTDB_OSVersion, length("Version 3.51") + 1, "Version 3.51", -1);}elseif($version=~ m/OSVersion_WindowsNT_4_0/){crowbar::WTAddRecord($crowbar::WTDB_OSVersion, length("Version 4.0") + 1, "Version 4.0", -1);}elseif($version=~ m/OSVersion_WindowsNT_5_0/){crowbar::WTAddRecord($crowbar::WTDB_OSVersion, length("Version 5.0") + 1, "Version 5.0", -1);}if($type=~ m/OSType_Unknown/){crowbar::WTAddRecord($crowbar::WTDB_OSType, length("Unknown") + 1, "Unknown", -1);}elseif($type=~ m/OSType_Unix/){crowbar::WTAddRecord($crowbar::WTDB_OSType, length("Unix Server") + 1, "Unix Server", -1);}elseif($type=~ m/OSType_WindowsNTServer/){crowbar::WTAddRecord($crowbar::WTDB_OSType, length("Windows NT Server") + 1, "Windows NT Server", -1);}elseif($type=~ m/OSType_WindowsNTPDC/){crowbar::WTAddRecord($crowbar::WTDB_OSType, length("Windows NT Primary Domain Controller") + 1, "Windows NT Primary Domain Controller", -1);}elseif($type=~ m/OSType_WindowsNTBDC/){crowbar::WTAddRecord($crowbar::WTDB_OSType, length("Windows NT Backup Domain Controller") + 1, "Windows NT Backup Domain Controller", -1);}elseif($type=~ m/OSType_WindowsNTWorkstation/){crowbar::WTAddRecord($crowbar::WTDB_OSType, length("Windows NT Workstation") + 1, "Windows NT Workstation", -1);}elseif($type=~ m/OSType_WindowsNT/){crowbar::WTAddRecord($crowbar::WTDB_OSType, length("Windows NT") + 1, "Windows NT", -1);}elseif($type=~ m/OSType_Windows95/){crowbar::WTAddRecord($crowbar::WTDB_OSType, length("Windows 95/98") + 1, "Windows 95/98", -1);}elseif($type=~ m/OSType_Windows98/){crowbar::WTAddRecord($crowbar::WTDB_OSType, length("Windows 98") + 1, "Windows 98", -1);}} </Test>
```

Appendix 2.
Example audit carried CyberCop CASL system

```
# spoof_check.cape
# this script is used by the built-in filter checks
# please do not modify it
ip
ip_version=4
ip_proto=IPPROTO_UDP
ip_flags=0
ip_id=42
ip_done
udp
udp_sport=6834
udp_dport=5574
udp_done
data=SAS-ipspoofing
end_of_packet
```

References

1. Shagin V.G. Protection of information in computer systems and networks. – DMK-Press, 2012. – 192–201 p.
2. Domarev V.V. Safety of information technology. The systems approach. – K.: TID Dia Software Ltd., 2004. – 90–92 p.
3. Zegzhda D.P. Fundamentals of Information Systems Security / D.P. Zegzhda, A.M. Ivashko – Moscow Hotline – Telecom, 2000. – 325–356 p.
4. Smoked A.P., Zefirov S.L., Golovanov V.B. Information security audit. – BDC-press, 2006. – 289–304 p.
5. Stoling William. Cryptography and network security: Principles and Practice, 2nd ed.: Trans. from English. – M.: Publishing house «Williams», 2001. – 329–372 p.
6. Torokina A.A. Engineering and technical protection of information. – Publisher «Helios ART», 2005. – 63–78 p.
7. Galatenko V.A Risk management: a review of commonly used approaches [electronic resource]. – 2012. – URL: http://citforum.ru/security/articles/risk_management/ (date of circulation: 04.09.2013).

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*Short Reports***MATHEMATICAL MODELING
OF SOIL BASES**

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Reliability is an important factor design to consider the variability associated with the design inputs. Parameters such as mean, maximum likelihood, median, coefficient of variation, and density distribution function of subgrade strength are determined [1]. The approach is based on an extensive literature review of current damage concepts included in current mechanistic-based design procedures, soil permanent deformation laboratory data. The physical properties of subgrades structures significantly influence both the response of the subgrades to applied loads and the long-term performance. It is, therefore, of the utmost importance that full scale test subgrades be constructed with uniformity in material properties, layer thicknesses, and other considerations for which non-uniformity might result in nonrepresentative and nontypical behavior and failures. Current mechanistic-based design methods for the design of subgrades use vertical strain criteria to consider foundation rutting.

A considerable number of measurements of the physical properties test pavements were made at all stages of construction and after construction was completed. The measurements were made for three purposes: construction quality control, construction

acceptance, and material characterization. The material characterization tests were performed to provide information for theoretical modeling and were not related to construction and contractual requirements. For a basis of model building we take the model of elastic foundation, Vlasov owl Leont'ev [1]. The choice of the appropriate type of foundation is governed by some important factors such as: the nature of the structure; the loads exerted by the structure; the subsoil characteristics; the allotted cost of foundations. Therefore to decide about the type of foundation, subsoil exploration must be carried out. Then the soil characteristics within the affected zone below the building should be carefully evaluated. The allowable bearing capacity of the affected soil strata should then be estimated. Theory of elasticity analysis indicates that the stress distribution beneath footings, symmetrically loaded, is not uniform. The actual stress distribution depends on the type of material beneath the footing and the rigidity of the footing. For footings on loose cohesion-less material, the soil grains tend to displace laterally at the edges from under the load, whereas in the center the soil is relatively confined. This results in a pressure diagram somewhat as indicated in [2].

References

1. Petrov V.V. Dimensional model of nonlinear deformable heterogeneous base // Interuniversity scientific collection. – Saratov: SSTU, 2007. – P. 6–12.
2. Artamonova E.N. On the design of slabs on the basis of a non-uniform. – M.: INGN, 2012. – P. 4.

Materials of Conferences

**ACTIVITIES
OF MUSICAL-ETHNOGRAPHIC
COMMISSION AND ITS SIGNIFICANCE
FOR MODERN RUSSIAN
ETHNOMUSICOLOGY**

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Ethnomusicology developed in collaboration with other scientific sectors involved in the study of traditional culture, such as anthropology, ethnography, in Russia in the early XX century. The synthetic nature of the Russian ethnomusicology was largely determined by the prevailing during the XIX century traditions of collection and study of folk songs. Relying on a wide area of human knowledge is reflected in the general trends emerging in related scientific fields. Ethnomusicology and ethnography are representative examples.

At the beginning of XX century these sciences:

- have studied a single set of problems (this includes, questions the historical development of folk culture, the structure of people's poetry, musical rhythm, song of variance);
- were focused on solving applied problems associated with increasing the accuracy of records and obtaining reliable material in the field of collecting;
- cover a single area of research expedition, sought to master all the new stylistically regional traditions, the search for new centers of folk art;
- studied increasingly broad layers of oral folk tradition (from the Archaic, up to the present).

Of great importance was the work of education, popularization of folk samples to a wider audience in the work of ethnographers and musicians.

The transition to the collection and study of songs from individual enthusiasts to the newly created scientific societies accomplished in Russia in the second half of the XIX century. Scientific societies carried expedition and field research, published works, have organized demonstrations of song samples from the scene.

The largest folklore center last third of the XIX century was the Ethnographic Department of the Society of Natural Sciences, Anthropology and Ethnography (OLEAiE) at the University of Moscow. This department is united around a specialists of different directions. It consists of well-known scientists – historians, anthropologists, linguists, and later they were joined by musicians. Ethnographic Department was of great importance in the development of ethnomusicology in Russia. This department was the progenitor of the Musical-ethnographic Commission (MEC). The Commission was the largest scientific center in Russia in the early XX century. Activities of MEC (1901–1917)

concentrates the most important areas of study, collection and enforcement of a folk song.

There are three main directions in the activities of the Musical-ethnographic Commission:

- research direction (study the structural features of the folk song, keeping the tradition of lighting problems, criticism of previous collectors);
- collecting direction (fixation of folk music, the use of advanced technologies such as the phonograph, photography, filming);
- educational direction (popularization of folk music, expanding audience and its involvement in the learning process).

Musical-ethnographic Commission is a scientific and educational organization. MEC was engaged in fixing the musical-ethnographic material, its study and dissemination of folk songs. Particular importance was given to the reliability and accuracy of publications of songs [4, 115].

Started recording in the collecting work was accompanied by numerous public lectures with demonstrations of phonograms and displays samples of folk music in its original form the largest members of the intelligentsia, such as L. Tolstoy [1, c. 325–326].

The emergence of the first phonograph publications («The Great-songs in the folk harmonization» by E. Lineva [2, 3], «Proceedings of the Musical-Ethnographic Commission» [5, 6]) proved the possibility of using sound recordings for scientific purposes. All this was accompanied by a wide public response.

Comparison of the Ethnographic Department OLEAiE and educated in the subsoil MEC suggests the presence of a general trend of development of ethnomusicology and related disciplines, directed towards increasing specificity studies, staging professional problems at the same time with increasing specification.

There is a continuity between editions of the Ethnographic Department OLEAiE and MEC in the study of song in close connection with the other parties of national life.

The interest in musical folklore problems increases significantly in the works in the field of ethnography. Ethnographers working on issues of application (method of musical notation) and scientific and theoretical nature (problems performing style, the study of musical perception of folk singers, issues of communication and professional folk music, etc.).

Continuity between the Ethnographic Department OLEAiE and MEC also manifested in the activities of musicians of the early XX century. They continued to use the well-established method for the study of oral folk tradition with correspondents in the field. Musicians published gatherer program,

bibliographies (for example, «Bibliography of books and articles on musical ethnography», published in the «Proceedings» IEC [5, 6], to cover a wide area of the humanities, including work on the musical folklore, history, dialects, ethnography). They wrote reviews, which were considered to become traditional ethnography questions.

At the same time, the musicians, that were part of the MEC, have developed purely musicological problems. In reviews they considered particularly meaningful song collections formed the basis of the beginning of XX century standards of ethnomusicology. They have been raised both general and more specific issues about the state of individual aspects of musical folklore of science in specialized scientific and music publications. These include questions of rhythmic and modal structure of folk music, folk and professional interaction between musical cultures, traditions of inter-ethnic cooperation.

With the advent of phonographic recording musicians have raised questions about the extent to which phonograms and notations, about the perfection of a technique of musical notation, about the need for corrective action in the course of decoding phonograms, based on rhythmic patterns, structural and modal structure of the songs.

Some works suggest the emergence in the late XIX century, the first samples of analytical notation and thus call into question the firmly entrenched in contemporary ethnomusicology opinion about the origin of this method in the middle of the XX century in connection with the works by E. Gippius.

In the activity of MEK crossed several lines. The first line is determined by the continuity in the study of musical characteristics of folk songs, by traditions, its embedded in the publications of XVIII–XIX centuries. Thoughts outstanding predecessors, such as N. Lvov, V. Odoevsky, A. Serov, P. Sokalsky, have organic implementation of the early twentieth century.

The second line is due to the continuation of the traditions of the Ethnographic Department OLEAiE, with the development of the proposals put forward by historians, ethnographers, linguists. Using the documented material and its interpretation was the impetus for the emergence of new ap-

proaches in the study of folk songs, which are characteristic of modern science.

The third line is due to the presence of multi-lateral ties between Russian and Western European ethnomusicology.

The inclusion of quickly developing domestic ethnomusicology in the context of the era led to the fact, that the Commission is like a snapshot of the diverse phenomena not only in Russia but also worldwide in its structure and working methods. All of this allows us to state on the fundamental position of MEC in the development of Russian ethnomusicology.

The multi-faceted and versatile activities of the Commission represents the result of all previous work on the collection and study of folk songs in Russian and is a synthetic character.

Assessing the activity of MEK, it should be emphasized that at the beginning of XX century folklore as a science in the modern sense is just beginning to take shape. Terminology remains undeveloped. However, the beginning of the twentieth century is replete with bright discoveries in the field of scientific thought, the methods of collecting, notation and interpretation of folk music.

At this time, the main thing was the realization of goals and objectives of ethnomusicology and as a consequence, formulation of such problems, which is still relevant to today. All this allows us to talk about succession in the study of folk music and to consider the development of the Russian ethnomusicology in a historical perspective throughout XVIII–XX centuries, as a single progressive process.

References

1. Goldenveyzer A. Near Leo Tolstoy. – M., 1959. – 487 p.
2. Lineva E. Great Russian folk songs in the national harmonization. – Part 1. – Saint Petersburg. 1904. – 90 p.
3. Lineva E. Great Russian folk songs in the national harmonization. – Part 2. – Saint Petersburg. 1909. – 65 p.
4. Proceedings of the Musical-ethnographic Commission. – Part 1. – M., 1906. – 548 p.
5. Proceedings of the Musical-ethnographic Commission. – Part 2. – M., 1911. – 495 p.

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*Materials of Conferences***CLUSTER CONCEPT IN REGIONAL INNOVATIVE DEVELOPMENT: THEORY AND RUSSIAN PRACTICE**

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At the regional level, clusters are considered as balanced mechanism policy of innovative development of the area, are favorable conditions for the effective cooperation of regional actors and institutions of science, government and business, the development of various forms of public-private partnerships in the area of innovation. General recommendations for regional policy development clusters lie in the fact that such a policy eliminates or reduces regional barriers and supports clusters, does not replace market mechanisms that form of objective conditions for the development of clusters. The central part of the innovation cluster structure in the region – companies, which depends on the actions of the direction of the cluster, the nature of the projects and programs developed by the commercialization of scientific -governmental organizations for innovative products and the latest technology. In some regions of Russia already has several clusters formed around key industry sectors and selected Russian cities with a high concentration of activities in the field of research and development in certain areas. Among the key issues in the development of domestic cluster structures at the regional level: the lack of funding, the choice of the industry in which a given region could be developed, informed economic agents about ongoing and planned cluster initiatives. In the Krasnodar region initiative on creation and development of cluster structures are offered in the following areas: engineering cluster, the cluster woodworking processing, a cluster of food processing industry, wine cluster, a cluster of petrochemical, transportation and logistics cluster.

The Introduction. The cluster theory is especially highlighted, among the various formation and development mechanisms of the economic systems competitiveness of the localization different levels. The «cluster» concept is practically at its basis, as the efficient and the interconnected groups' concentration of the competing companies, having provided the competitive positions in the industry, national, and the global markets. Thus, the clusterization has been become the increasingly significant part of some countries' regional policy in the field of the innovation development. For example, the European Union, in the framework of the funds development for the clustering structures financing for 2007–2013-es ha been allocated

the substantial sums to be supported the clustering initiatives further development in many European regions and areas. In 2009, 26 from 31 European countries, having entered into the EC, the clustering programs have already been implemented at their national level. So, the European Clustering Observatory is practically being operated at the EC level. The «Regions of Knowledge» implemented knowledge, as a part of the Framework EC Program for the Research and Development is being promoted the networking cooperation at the all – European level between the innovation clusters, having included into themselves the local authorities, the enterprises, and the research centers. This initiative budget (e.g. 2007 – 2013-es.) – is 126 mln. euro. So, the final result should be strengthened the investment and innovation the regions' capacities, as well as their ability to be participated in the all – European Research Projects [9]. The Report of the US National Research Council [4] is also the considerable attention is practically paid to the clustering policy, including the development measures policies at the Regional level. In particular, the US Department of Commerce is charged with the competitive grants selection for the innovation regional clusters, as well as the Research and Information Programs Establishment for the regional innovation strategies further development. So, in 2010, by the US federal Government, at the aims of the activities coordination, in the field of the clustering policy, the Commission has been established by the territorial innovation clusters (e.g. the Federal Task Force on Regional Innovation Clusters). Also, the inter – agency coordinating bodies at the different times have already been established in Finland, France, Norway, Sweden.

So, the clusters are being acted by the balanced mechanism of the development policies in the region, they are the favorable condition for the efficient cooperation among the regional subjects and the science, government, and business Institutes, the various forms creation of the public and private partnership. The innovation activities are being activated in the regions; the innovation infrastructure is being formed and further developed through the clustering process, resulting in the industrial potential further increase of the area. It should be considered in the mind, the regions are being differed by their economic development level and because of this, their innovation results are being varied considerably, with the clustering concept further development at the regional level. In this regard, there cannot be the regional – universally policy, each region should be developed their own unique set of the measures to be supported the clustering structures.

So, the general recommendations to the clusters further development regional policy are reduced to the fact, that such kind of the policy is eliminated or is decreased the existing regional barriers, and it is supported the clusters. But, at the same time, it is not replaced the market mechanisms, having formed the objective conditions for the clusters' establishment and their further development in the certain areas. As the world practice is practically testified, the regional cluster policy is preferred mostly to the indirect tools and, in some cases, it is avoided the direct intervention.

The Cluster Concept: the General Notions

So, there are quite different clusters' types and their classifications: the financial, the innovation ones, and the others. In particular, under the innovation cluster they are understood the geographical concentration (e.g. the projected or the spontaneous one) interconnected innovation – oriented firms and the companies, the core of which is a few of the most sustainable enterprises of the real sector of the economy, that can be provided the effective and the solvent demand for the innovation developments and their design [2]. The cluster members are practically connected by the external and the mutually complementary relationships, which are usually situated next to each other (e.g. within one region or the neighboring areas) [3]. The regional cluster is practically considered, as the area of the highly concentrated activities of the interconnected companies and the organizations from the same or the related sectors of the economy, having operated and developed in the limited geographic area (e.g. the region).

The quite different mechanisms and the instruments for the clusters further development stimulating are used in the framework of the state cluster policy of the countries, including the creation of the specialized coordinating, the advisory, and the working bodies, the organizing and the expert – analytical analysis support provision of the regional clusters further development, the direct state co-financing of the programs and the projects realization of the regional clusters further development and the others. In particular, the project on the Bio Regio biotechnological clusters further development has been realized in Germany since 1995. The program on the innovation clusters formation – the competitiveness poles – is practically being realized in France. The cluster approach has also been used for the industrial policy further development of Finland in 1991 – 1993-es.

The cluster members are usually enjoyed a variety of the different economic benefits and their advantages, due to the geographical proximity and the activity specifics: the access to the specialized human capital and the suppliers, to the unique knowledge and their replication in the other sectors, the efficiency and productivity increase. So, the administrative, Institutional, and organizational links are led to the fact, that one cluster is practically con-

nected with the others. The key point in the cluster's structure – is the innovation spread on the entire value chain and the single logistical window for the interaction with the external environment [1].

The clusters are increased their productivity and the regional enterprises and the companies functioning efficiency, through the linkage, the external effects and their interaction between firms and the companies and the related enterprises and the agencies, the further coordination improvement, and the best and the advanced practices further dissemination. The clusters are further stimulated the innovation environment and the technological innovations further development. For example, the IT-clusters in the Silicone Valley, and Bangalore. So, one cluster is often generated and activated the other clustering structures activity, because it is resulted in the activity «dissipation» in the value creation chain (e.g. «the domino effect») for the risks reduction, in the access improvement to the cheap resources, in the services improvement of the specific regional markets. «The domino effect» example – is the optics cluster in Arizona, which has been stimulated the clusters' organization in the aerospace industry, informational technologies, and the biological sciences.

The Clusters' Development in Russia at the Regional Level

The creation value of the innovation clusters in the different regions is conditioned by the need in the efficient further economic development of Russia. Within the cluster, all the members are given their opportunity to be functioned, as the competitive enterprise, having sheared their experiences in the formal and the factual collaboration with the other firms and the companies, while, for all this, maintaining their flexibility and the possibility to be increased the innovation potential. Within the frameworks of the further development regional policy, the clusters are being considered, in the context of the new competitive advantages formation of the regions, the growth poles, as well as the existing infrastructure strengthening of the regional production.

Several clusters have already been existed in some regions of Russia, having formed around the key branches of the industries: the Aerospace one in Moscow and Samara, the Agro-Industrial one in the Krasnodar Region, and Belgorod Area; the Information and telecommunications one in Moscow, Saint-Petersburg, Novosibirsk and Tomsk Regions, the Machine Building one in Lipetsk and Samara Regions and the others. Some Russian cities and towns with the high level activities' concentration in the field of the Researches and the further Development in the certain and the specific areas are the significant generators of the knowledge and the potential centers of the scientific clusters: Dubna, Obninsk (e.g. the Nuclear Technologies); Korolev, Khimki (e.g. the Space and the Missile Technologies); Zhukovsky (e.g. the Aviation Technologies);

Zelenograd (e.g. the Radioelectronics and the Microelectronics) and the others.

According to the WEF's experts, the domestic clusters cannot, yet, be competed with the foreign structures, and the entities, as they have been created, mainly, in the traditional sectors of the economy, which are weakly developed. In addition, the domestic clusters almost cannot be functioned without the Government support. Today, even the Moscow Region and Saint-Petersburg cannot be competed with, as the world leaders (e.g. Tokyo, the Silicone Valley, Seoul), well as with the averaged ones, by their development level of the Regions' innovation clusters (e.g. Helsinki, Tel Aviv). So, not high and low level of the Russian's clusters' development is confirmed the rating by the Global Competitiveness Index, according to which, Russia, for this indicator, is in the list's outsider, and it is lagged behind not only a number of the developed countries, but also from the BRICS's group countries. So, in 1912, it took only the 114-th place among the 144 countries throughout the world (e.g. China, Brazil, and India the 23-rd, 28-th, and 29-th places, respectively). One of the clusters' formation challenges in Russia is the sector's industry choice, in which one or another Region could be developed. Another challenge – is about the economic agents' information on the clustering initiatives and the clustering policy, on the whole. There is, moreover, and the objective need in the persuading on the positive effect from the business members' clustering – the process, that traditionally do not accept any innovations and they do not willing to be taken any risks, having participated in the inter-firm and the corresponding inter-company cooperation.

It is aimed to be changed the emerged situation on the allocation and the project's government support of the leading innovation clusters of the country. To this end, in August, 2012, it has been approved the list of the 25 Russian's innovation regional clusters [8]. The Biopharmaceutical cluster in the Arkhangelsk Region, the Shipbuilding innovation regional cluster in the Kaluga Region, the Cluster of the ZATO Innovation technologies in Zheleznogorsk town and the others – are among all these clusters. Thus, the clusters are completely supported from the Federal and the Regional budgets, on the basis of the co-financing to be met the challenges solution of the infrastructure's further development. Thus, the already selected clusters in their perspective are practically designed to be provided the positive external effects for the Region's innovation system and the country's innovation environment, on the whole, the intellectual capital attracting to the intensive scientific and the research work. So, it is proposed, the cluster members to be jointed the related the technology platforms in order, to be enhanced the achievements' effect and the networking cooperation expanding inside the cluster itself.

Thus, the clusters further development at the regional level are contributed to such latest Governmental initiatives, such as the following:

- the networking creation of the national Research Universities, by the leading Higher Educational Institutions' of the country assigning the corresponding status («the National Research University»), which is allowed the Institutes of Higher Educations, the Universities, and the Colleges to be gained the access to the governmental funding for the purpose of the new curricula, the international mobility, and the scientific and research infrastructure supporting;

- the further development program of the Universities' innovation infrastructure (e.g. the business – incubators and greenhouses, the industrial and technology parks, the engineering centers);

- the technology platforms creation – the networks on the basis of the partnership – having aimed at the strengthening ties and the cooperation among the leading manufactures the suppliers, the scientific and research organizations, the Universities, and the engineering companies [5]. Such kind of the platforms have already been organized, as the public – private partnerships, and, they, moreover, are included the laser and the optical technologies, the national software platform and the others;

- the project realization on the «Skolkovo» Innovation Center implementation [6], having included the Technical University («SkolTech»), and as well as some specialized clusters (e.g. the Information technology one, the Aerospace one, the Biomedical one, the Energy efficiency one, and the Nuclear one), and the Industrial and the Technopark.

Thus, the objective assessment of these above – indicated public and governmental initiatives on the clusters further development to be conducted much early, as the arrangements have recently been realized, and many of them have had the long – term effects. So, it is quite obvious, that the final results will be depended on the coordinated and the systematic actions of the Government, the needs and the interests of the business and the other stakeholders and the subjects concerned satisfaction (e.g. as the national, well as the foreign ones). The efficient and the transparent legal system, the positive business climate, the internal competition, the stimuli and the incentives for the direct foreign investments, the Governmental initiatives' and their reforms' transparency, the complete confidence from the business side to the policies implemented – are among the key factors for the final success.

The Innovation Cluster Formation Direction in the Krasnodar Territory

As the world practice in the innovation further development management of the regions has been testified, the cluster approach is one of the most efficient methods to be ensured the economy growth. So the clustering strategy formulation, in the framework of the general innovation

strategy of the region, the first – priority sectors of the clustering support identifying is practically the most actual challenge and the urgent task, in the framework of the regional policy of the Krasnodar Territory's innovation further development.

By the level of the innovation further development, the Krasnodar Territory is referred to the «innovation leaders» in SFD (e.g. the organizations' share, having involved in the scientific researches in the subjects of SFD is made up 20,8%), and it is on the 27-th place among the subjects of Russia. By the value of the Russian Regional Innovation Index of 2012, having calculated by the SRM HSE, the Krasnodar Territory is occupied the 57-th place in the rating. In the period, from 2007 up to 2011-es, it is observed the innovation activity level decrease of the Krasnodar Territory's organizations, having engaged in the technological innovations (e.g. from 6,4% down to 4,6%) [7].

Among the most significant challenges of the innovation process further development at, as the national, well as the regional levels – the lack of the developed communications and the science with the production interaction, the mechanisms, having provided the commercial application of the scientifically – research and the innovation developments. It is presented, that the clustering program will be bridged the gap between the fundamental, research works and the directly introduction into the production implementation, and the further these results' commercialization on the market. The cooperative and the competitive relations formation between the potential members of the regional cluster will help to be modernized the production and the management processes, and, ultimately, to be improved the overall level of the innovativeness of the Region.

So, the regional administration is served by the regional clustering programs' initiator. The industry's sector evaluating and its further selecting challenge are practically faced before it, in the framework of which the cluster further development is much profitable. So, it is proposed a number of the clustering initiatives implementation, including: the Machine building cluster (e.g. the cluster centers – are Krasnodar, Tikhoretsk, Kropotkin, Armavir, Abinsk); the Cluster of woodworking and the production of wood products; the Food and processing industry cluster; the Wine – making cluster; the Petrochemical cluster; the Transport and logistics cluster, and the others by the Ministry of strategic development, investments and foreign economic activity of the Krasnodar Territory.

It, moreover, should be noted among the main recommendations for the clustering structures' establishment and their further development on the Krasnodar Region's territory, that the central part of the clustering structure in the Region should be acted the business – enterprise of the specific branch of the industry, which is practically dependent on

the actions of the cluster further development direction, the nature of the projects and the programs developed, the commercialization of the innovation products and the latest technologies use, having developed by the scientific organizations. So, the clustering processes influence, as a rule, is extended beyond the single branch of the industry, therefore, the enterprises' potential realizing is involved the partners from the related branches of the industry and the intermediaries (e.g. for example, the financial and the logistic one), having taken their responsibility for the non – profiling or the underdeveloped functions execution.

Thus, it is quite possible the conclusion can be made by us, that the efficient challenges' solution in the field of innovation further development (e.g. including the inadequate funding, the poor participation of the business circles members, the low interest in the cutting – edge researches deployment, the low degree of the innovation products commercialization) at the regional level is presented by means of the mutual relations system modernization among the economic subjects of the Region, their innovation activity intensification on the basis of the clustering approach. The innovativeness overall level of the Krasnodar Territory can also be upgraded, due to the cooperative and the competitive relations formation among the potential members of the regional cluster.

References

1. Afanasyev M., Myasnikova L. Global Competition and Clustering Economy // Economic Issues. – 2005. – № 4. – P. 75–86.
2. Ratner S.V., Malhasyan S.S., Arakelian N.R. Design and Management Research Network of Regional Innovation Cluster // Economic Analysis: Theory and Practice. – 2009. – № 4. – P. 20–24.
3. Clusters for competitiveness. A Practical Guide & Policy Implications for Developing Cluster Initiatives. – PREM, The World Bank, 2009.
4. Rising to the Challenge. U.S. Innovation Policy for the Global Economy. Ed. By Charles W. Wessner and Alan Wm. Wolff, National Research Council. The National Academies Press, Washington, D.C., 2012.
5. Rudnik P. Technology Platforms in the Russian Innovation Policy Practice // Foresight- Russia. – 2011. – № 5 (1). – P. 16–25.
6. The Official Site of the «Skolkovo» Innovation Center. Available at: <http://www.sk.ru>. (accessed 18.09.2013).
7. The Official Site of the Ministry of Industry and Trade of the Russian Federation. Available at: <http://www.minpromtorg.gov.ru/> (accessed 18.09.2013).
8. Cluster Observatory Russian Higher School of Economics. Available at: <http://cluster.hse.ru/pilots> (accessed 18.09.2013).
9. European commission. Regions of knowledge. Available at: <http://ec.europa.eu/research/fp7>. (accessed 18.09.2012).

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SYSTEMS CONCEPT DEVELOPMENT

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The article describes the path which the science has passed from the systems theory generation up to contemporary visions of systems. The works of science classicists such as L. von Bertalanffy, A.I. Uyomov, J.G. Miller, H. Maturana, as well as results of works of existing academic communities such as SPSUACE «Methodological problems of efficiency of investment-construction complexes» as «self-organizing and autonomic systems» have been studied in the article. This work is also focused on and critically evaluates major principles of systems theory (system structure, system elements non-uniformity, system observer integration), living systems theory (levels of organization, processors of living systems), autopoietic theory (requirements to system elements and six conditions criterion, interrelation with entropy and negentropy). Special attention is paid towards the advanced researches devoted to the living systems: living systems theory and autopoietic concept. Referring to the fact, that systems consisting of living and non-living elements, act differently, the author of the article shows the transition from studying of systems as mechanisms to living systems research.

Systematization concept, system notion and even theories in the modern scientific paradigm were developed rather long ago and currently hold its firm place in it. Despite the creation of various systems theories, the efforts to establish a universally acknowledged systems concept were unsuccessful. It is rather complicated to unite the results of works of L. von Bertalanffy, R. Ackoff, V.N. Sadvovsky, A.I. Uyomov, A. Rappoport, Yu.A. Urmatsev, B.S. Fleischmann, W.R. Ashby, M. Mesarovic, L. Zadeh, G. Klir and others.

Academic community has divided into two main determination groups. One of them leans towards the philosophic understanding of the term «system», while the second is based on practical use of system methodology and gravitates toward the elaboration of general scientific system notion. The latter is widely represented in the foreign systems movement (W.R. Ashby, G. Klir and others).

There are a lot of works written regarding the system notion development. Therefore, it is to expand on the contemporary understanding of the term «system». At present the term «system» is used in the scientific sphere in cases when it is necessary to describe the object under investigation as a certain complex unity, which is impossible to immediately provide an idea of, representing it graphically or by means of mathematical expression (formula, equation, etc.). The system is usually considered as a complex of elements and relations between them.

Mathematically it can be represented by a formalized notation:

$$S = [\{a_i\} \& \{r_j\}];$$

$$\text{def } a_i \in A \quad r_j \in R. \quad (\text{a})$$

It reveals the fact that the system is not a simple complex of elements and diverse relations and includes only those relations and elements which lie in the intersection (&) with each other.

If the system elements are non-uniform, it is reasonable to divide them into different sets of elements. For example, M. Mesarovic (M. Месарович, 1978) distinguished the set X of inputs and set Y of outputs, between which there is intersection which can be represented as follows:

$$s \subseteq X \& Y. \quad (\text{b})$$

Attributes (Q_A) are also included into the system notion in order to specify the elements and relations. It shall be noted as follows:

$$S_{\text{def}} = \langle A, Q_A, R \rangle. \quad (\text{c})$$

It ought to be remarked that the elements and components are often used as synonyms. However, strictly speaking, components are more general definition comparing to the elements and also can signify the complex of them.

A.I. Uyomov has expanded the above notion (Уёмов, 1978), by adding the attributes (q_i) standing for relations (r_j) along with attributes (q_i) describing elements (a_i).

The notion of objective appears in the system determinations while following the specification, at the same time the objective achievement conditions (environment SR, time interval ΔT) are specified in some of determinations (Перегудова, 1976). Thus, the system determination has the following view:

$$S_{\text{def}} = \langle A, R, Z, SR, \Delta T \rangle. \quad (\text{d})$$

The observer (N) is gradually involved into the system determination in addition to all the stated ones (N) – it is a person that represents an object or a process as a system at their studying or decision making. Referring to observer effecting the system, as well as system effecting the observer, the system shall be represented as follows:

$$S_{\text{def}} = \langle A, Q_A, R, Z, N \rangle. \quad (\text{e})$$

The selection of system determination reflects in fact the accepted concept and is considered the beginning of project planning. Moreover, it is important to realize that diverse determinations can be used at different system vision stages depending on the situation.

Analysing the systems determination development, it is possible to conclude that the ultimate solution has not been found yet. In prospect we can see how the entire theories and new fields of knowledge are being developed while searching for the unified universal system.

The change of systems science occurred after the scientists have concluded that the system consisting of people, e.g. economic or social one, has a range of attributes, which make it similar to a living organism. It is a living creature with its own cells, metabolic process and nervous system. Various public institutions within it act as organs, each of them performs its own special function in order to support the organism activity. The army, for example, act similarly to immune system, defending the organism from penetrations from outside, while the government takes decisions and rules similarly to the brain. This vision was at first given in the ancient world by the Greek philosopher Aristotle {Чанышев, 1981 #48} {Чанышев, 1981 #48} {Чанышев, 1981 #48}.

The science in its evolution has deviated from mechanistic view of the organisms. The scientists studying the living systems are attracted by the variability of processes, with the help of which the system adjusts to continuously changing environment. Many ideas and methods integrated in the sphere of «complexity theory», has led lately to the understanding of organisms as self-organizing and adaptable systems. The processes within these systems are decentralized, undetermined and change constantly. Complicated adaptive behaviour of such systems originates in the process of interaction between separate autonomic components. And the patterns, where the regulation conforms with a separate unit, have been accepted as insufficiently compliant with reality for the majority of real systems.

The above factors resulted in condition that in 1978 the general living systems theory was created in order to organize existing knowledge in the sphere of systems similar to a living organism (Jackson, 2002). The term of living systems was introduced by James Grier Miller in 1960 in order to signify the open self-organizing systems interacting with the surrounding environment and having specific attributes, peculiar for the living beings.

The main idea of life turns up in the process. If the process of matter-energy and data treatment stops, life is therefore over. Determinant life feature is ability to continuously maintain a steady state, where the entropy (or chaos) inside the system is significantly lower than inside its non-living surroundings. The living systems can maintain this state, being open and self-organizing systems at the same time, which are able to involve any required information and matter-energy from these surroundings. These systems process greater amount of information in comparison with non-living systems, except for the computer systems, which have much higher ability to process data.

According to the concept elaborated by J.G. Miller (Miller, 1978b), the living systems form eight levels of organization, complexity, evolving from a cell up to supranational system. The most typical examples of such wide range of living systems are a unicellular amoeba and United Nations

organization or International Monetary Fund. These are the levels: unit, body or organ, organism, group, organization, community, society and supranational system. The system permanently includes 20 critical subsystems (processors) at each level, which process the matter/energy or information, excluding two ones processing both the matter/energy and information: reproducer and boundary (Miller, 1978b).

At the same time society stands for any element, which has a mass and occupies physical space. Energy is determined in physics as an ability to execute the work. With reference to the energy conservation law, it can be stated that energy cannot be produced or destructed in the Universe, but it can transform from one type into another. Mass and energy are equivalent. This work applies to the integral definition of the matter-energy, since close interrelation of the matter and energy is commonly known. The living systems require specific types of the matter-energy in sufficient quantity (heat, light, water, vitamins, mineral substances). Energy required for implementation of processes within the living systems, is obtained from dissipation of molecule (or atoms regarding some social systems) (Miller, 1978a).

Marker is used as an information medium unit in general theory of living systems. This term serves for designation of signals, units or changes of the matter-energy, arrangement of which contents information from source to receiver (von Neumann, 1951). The marker can be represented by any information medium accounting from pages of «The Word about Igor's Regiment» up to TCP/IP protocol packets. Development of communication technologies increases the efficiency of data transfer, reducing the mass of markers and making them smaller so that they could be stored more compactly and transmitted faster and cheaper.

Practically any communication requires marker movement in the space from transmitting system to receiving one. This movement is subjected to the same physical laws as the movement of any other matter-energy type. The information is measured in bits (binary system position) being the lowest measurement unit providing two possible alternatives. Ability to store the information can be estimated by comparing mass of the marker and amount of information on it. For example, clay tablets with the wedge writing of the Sumeria times contain 10^{-2} bits per gram of the matter.

Information processors are used for processing the data inside the living system. Thus, the first-type processors interact with the matters or energy for implementation of metabolic processes in the organism. The other subsystems transmit information for coordination, direction and control inside the system. Some of the processes carry out both types of exchange simultaneously.

Another essential difference between the living and non-living systems lies in the fact that all the living systems include such components as DNA, RNA, cell proteins, which provide the living sys-

tem with unique properties. These components are not synthesized in the environment, but produced inside the system itself.

It is important to emphasize interrelation of the living systems functioning with entropy and negentropy. Entropy means chaos, self-destruction and self-decomposition in a simple understanding. Negentropy respectively is movement towards arrangement, organizing of the system. Regarding the living systems: in order not to die, the living system fights with the surrounding chaos by means of organizing and arranging the latter, i.e. importing the negentropy. This is the way the self-organizing systems behaviour is explained.

The concept of autopoiesis became the development of the living systems science. The autopoietic system idea was first elaborated by two neurobiologists Humberto Maturana and Francisco Varela with the purpose of description of life as phenomenon typical for open self-sustained and self-reproducing systems (Varela). At the beginning of 1970s H. Maturana and F. Varela wrote several works devoted to autopoiesis theory (Maturana, 1980). Practically at the same time in 1979 Varela was to publish the work named «Principles of Biological Autonomy», (Varela F., 1979) which has elevated the mind and depth of his previous works. These books are the key theoretical literature of this sphere.

They describe the living formations as follows: «life is autopoiesis». The origin of this term is based on two Greek works: auto (αὐτό) -self- and poiesis (ποίησις) – creation, production. Word-for-word translation of the term «autopoiesis» means «self-reproduction».

The main idea of this term is revealed in the definition given in 1979. «Autopoietic system» is organized (specified as a unity) as a net of production processes (transformation and destruction) and consists of components which produce components:

1) which, interacting and changing, regenerate and implement the net of processes (relations) producing them;

2) composing it (the system) as a certain unity in the space, where they [components] exist, specifying the topological field of their realizations as this net» (Varela F., 1979).

Any unity corresponding to these requirements is an autopoietic system, and any autopoietic system realized in the physical space, is the living system. Special configuration of this unity – its structure – is not a sufficient condition for considering it as a unity. The key peculiarity of the living system is support of its organization, i.e. maintaining the net of relations which defines it as a system unity.

In addition to that, autopoietic systems are defined as systems, which reproduce themselves autonomously, and the only product of their organization is these systems themselves. It follows that this system takes care of its own support and growth and

perceive the surroundings as possible reason for instability of the internal functioning.

In order to determine the belonging of the object to the autopoietic systems, the classical autopoiesis theory suggests using the criterion of six conditions (Varela, Zeleny, 1992). In fact we have an algorithm of six steps to answer this question, whether the preset unity is autopoietic one. If a positive answer can be given to all these six questions, the system is autopoietic.

Nowadays the tendency of studying the living systems is one of the promising in the scientific world. Scientists of many countries work upon this problem of studying the living systems in economy. In Russia this issue is being studied since 2002 by school of science «Methodological problems of efficiency of investment-construction complexes» as «self-organizing and autonomic systems» at Saint Petersburg State University of Architecture and Civil Engineering managed by the honoured worker of sciences of Russian Federation, Doctor of Economics, Professor A.N. Asaul (Asaul, 2008).

References

1. Asaul N.A., (2004) Theory and methodology of institutional interactions of regional investment-construction complex subjects – St. Petersburg: Gumanistika. – P. 280.
2. Bertalanffy L. von, (1969) General system theory — A critical review // General systems. – M.: Progress.
3. Bogdanov A.A., (1989) Tectology: (General organization science) – M.: Ekonomika.
4. Heylighen F., (1999) The Growth of Structural and Functional Complexity during Evolution // The Evolution of Complexity / ed. J. Bollen & A. Riegler (eds.) F. Heylighen. – Dordrecht: Kluwer Academic.
5. Jackson Michael C., (2002) Systems approaches to management.
6. Miller James G., (1978) Living Systems. – New York: McGraw Hill.
7. Neumann J. von, (1951) Various techniques used in connection with random digits: National Bureau of Standards Applied Math Series 12: 36, 1951.
8. Peregudova F.I., (1976) Bases of system approach and its application to development of spacial ACS. – Tomsk: TSU.
9. Tracy L., (1994) Leading the Living Organization: Growth Strategies for Management. – London: Quorum Books.
10. Uyomov A.I., (1978) System approach and general systems theory – Moscow: Mysl.
11. Asaul A.N., Ivanov S.N., (2008) Decrease of transactional expenses in building due to optimization of information space. Edited by Asaul A.N. – St. Petersburg: ANO IPEV.
12. Maturana H., Varela F., (1980) Autopoiesis and Cognition: The Realization of the Living // Boston Studies in the Philosophy of Science. Vol. 42 / ed. Robert S. Cohen and Marx W. Wartofsky (eds.). – Dordrecht (Holland: D. Reidel Publishing Co.
13. Mesarovic M., Takahara Ya., (1978) General systems theory: mathematical basis. – M.: Mir.
14. Varela F., Francisco J., (1979) Principles of Biological Autonomy. – New York: Elsevier (North Holland).
15. Under editorship of Tyukhtin V.S., Urmantsev Yu.A., (1988) System. Symmetry. Harmony. – M.: Mysl.
16. Ackoff R., Emery F., (1974) On purposeful systems. – Moscow.

17. Varela F., Maturana H., Uribe R., Autopoiesis: The Organization of Living Systems, its Characterization and a Model. BioSystems.
18. Agoshkova E.B., Akhlibinsky B.V. (1998) System notion evolution // Philosophy issues – 170–179: No. 7.
19. Asaul V.V., (2008) Synergetic effect of unification of building organizations into competitive structures // Economic renovation of Russia. No.2(16).
20. Platonov A.M., (2008) Activity of school of sciences «Methodological problems of efficiency of regional investment-construction complexes as self-organizing and autonomic system» // Economic renovation of Russia No. 4(18).
21. Zeleny M., Hufford K.D., (1992) The Application of Autopoiesis in Systems Analysis: Are Autopoietic Systems Also Social Systems? // International Journal of General Systems Vol. 21.

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THE HR-MANAGER ACTIVITY RESEARCH FUNCTION IN HIGH-TECH ENTERPRISE

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Our study is aimed to be examined the origin causes and the possible ways for the acute staffing challenges overcoming, having developed in the last decade in a number of the Russian airlines. The young specialists', experts', and the professionals' exodus, the increase in terms of the appreciation and the training of the highly qualified specialists rise, needed to the high-tech production, the specialists' rapid deskilling, the human resources management strategy absence at many enterprises – all these and other challenges are fraught with the heavy social and economic consequences: the continuity and the connection between the generations loss at the enterprises, the improved cost of production, the competitiveness decrease of the manufactured products. To be prevented them, the airlines management is always needed of the operational information obtained, in particular, through the sociological monitoring.

The most interesting facts for the researcher have often been found, as a result of the interdisciplinary researches. So, the sociological methods application in the social and economic challenges study is allowed to be penetrated deeper into their nature and to be discovered the objective and causal dependences. Largely, thanks to the sociological methods high performance and their efficiency, the management solutions have been given the scientific justification, having concerned the employee motivation, the process organization of the beginners adaptation, the personnel marketing, the staff recruitment, placement and further promotion, the organizational core formation, the personnel evaluation, its development, the management teams formation and select team working methods, the career management of the professionals, the corporate culture formation, the employee

identification programs realization with the organization, and many others.

Therefore, today, there are all the grounds to believe, that along with the manager's classical functions, as having defined still by A. Fayolle – the planning, organizing, sharing, coordination, supervision, motivation – the modern manager on the human resources management should perform as well as his research function. It is also attached to the activities on the personnel management the strategic and innovative characters.

For the modern management systems construction (e.g. the quality management, the knowledge management), the knowledge and the skills are required to the leaders of all the administration levels of the high-tech enterprises, especially, in the field of the behavioral sciences (e.g. the psychology, sociology, and the social anthropology), as well as the economic and the social and management sciences, the social processes modeling and the prediction. They should be able to be stepped up the employees' creative potential, to be made the labor market analysis, to be created the reasonable motivational programs, to be able to be developed and to be communicated to the employees the successful activity criteria, as the organization, as a whole, and its individual structural elements and each employee.

The research function implementation of the manager on the human resources management is practically allowed to be realized the contingency approach in the management, efficiently to be monitored the quite new trends and its tendencies in the external environment, and to be made the adjustments and the corrections in the strategic and operational enterprises' plans, thereby to be increased the management decisions efficiency. So, it is not frequently, during such investigations the facts are opened and revealed, having allowed to be refuted or to be clarified the classical axioms of the management theory, and, moreover, to be changed the leaders' traditional guidelines and the directions, concerning the efficient methods of the management practices. For example, our studies of the recent years have been shown, that the people, who are engaged in the intellectual work, often, among all the stimulating and their motivating factors, are favored their opportunities for the creative self-expression, while maintaining the satisfaction average level of the physical needs. The publicly available statistics on the number of the layoffs airlines has been testified, the 67% of the workers at he age of 23–30 years old are being dismissed during the first year of the work, or (e.g. if they are the working students) – just after the Institute graduation. So, the differences in the dominant reasons for the dismissals of the staff's different categories have already been marked: if the workers with their length of the service, they are often dismissed, because of the size of their earnings dissatisfaction; then, the working students and the young specialists and the professionals, as the reason for their

layoff are indicated «the reality with their expectations mismatch» and, moreover, «the integrating complexity into the new organization». Thus, all these facts, **firstly**, are made us to be thought on the creation need of a closer links and their connections between the relevant educational Institutions and the enterprises, more active introduction and further implementation of the educational process, as the practice-orientated forms of the educational activities. **Secondly**, they are testified to the need for the changes in the content and their nature of the management motivational activities of these enterprises, which, in the recent years, has been focused on the outpacing salary growth of the young specialists, experts, and professionals. As a result, after a while, the quite clear and obvious distortion is begun to be felt in the states of the economic and the social situations at the enterprise: the work of the experienced, skilled, and qualified workers with their experience and the length of their service has been become to be paid for 25–30% less, than the Institutes of higher educations, the Colleges, and the Universities graduating students and the seniors, that, soon, has been led and resulted in the growing discontent and the number reduction of this category of the workers.

Thus, the secondary analysis of the empirical data is given its ground to be suggested, that under the existing circumstances, to be reached the personnel stabilization could be more actively, having used the motivational potential of the non – economic character measures, that have no less significant, than the high wages for the young specialists, experts, and professionals: the creative character of the labor officer, the prospects for the official and the occupational growth, the opportunity to be participated in the innovative projects, the opportunity providing of the self – reliant and independent solutions for the responsible challenges applications. So, this assumption must be verified empirically, however, even on the basis of the available data, it can be concluded, that any failure to be reached, until he system is the consequence of the managers' skills lack in the research function further implementation.

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MIDDLE CLASS IN RUSSIA: DESIGNATION CRITERIAS

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In spite of the fact that the question about designation criteria of the middle class in Russia remains opened and debating as well as the applicability of criteria to the Russian realia remains multivalued

we will try to formulate criteria of designation to the middle class.

Social space combines many scopes of activities. The individuum holds a definite position in each of it. Social-economical, social-political and social-cultural scopes are the most important scopes for identification the place of individuum or the group in social stratification. They intercross and the place of individuum or the group in social ranking is being imaged on this scopes.

Group of criteria can be single out for every scope that is being represented by it.

Thus, the social-economical scope is being defined by:

- property which also includes a manufacturing property;
- property management;
- incomings;
- employment by industry sector;
- professional occupation;
- territory of inhabitation.

The social-political scope is being defined by:

- wielding authority;
- compliance of administrative functions in state political and economical spheres.

The social-cultural scope is being defined by:

- educational level;
- qualification;
- self-identification;
- wants;
- interests;
- values;
- prestige;
- living habit and etc. [1, p. 59].

Criteria of designation of the middle class in the social structure of society can also be represented as objective and subjective. Objective criteria includes: income level, education, power, occupation and etc., as quite an objective units of measure underlies it – money, years, number of subordinates. Subjective indexes are: individuum's self-rating of his social status, circle of contacts, living habit, prestige and etc.

It is worth to notice that today among basic approaches that are being used to determine the middle class in the Russian sociology the next four ones are clearly given accent.

One of them connected with the superstition that the middle class is a mass social (subject that is being characterized by particularly higher living standard and consumption level) – use the per capita income level or existence of specific set of expensive property as the criteria of singling this class out.

The second approach is associated with the research of the middle class in modern Russia that has not only academic but also political value. This approach suppose to determinate the criteria of the middle class for the most part by emphasizing not on the material but on psychological and unique features of individuum as far as they influence in most part over his (theirs) social sense of self,

social-political mood and behavior. In that case the middle class is singling out on the basis of self-identification of people, their «self-enrollment» into the middle class.

The third approach is where the middle class divides into the so-termed «new» middle class that includes managers and specialists that are the owners of a high-level human capital assets or the owners of resource of power and «old» middle class – classic «petite bourgeoisie» or the so-called «small business» that collects dividends on its economical capital is an excellent attempt of practical application of such an approach for middle class analysis. The approach can be called as «related to resources» and its fundamentals are: volume, type and structure of the capital which is at somebody's disposal, at some household disposal and etc.

Finally the fourth approach is connected with the attempt of combined application of traditional criteria of singling out the middle class under the conditions in Russia (specific professional features, education, material-profitable features and self-identification). Occasionally this list of criteria widens. Other criteria that is connected with the capability of the middle class to fulfill any associated functions – «the stabilizer» of social-political and economical life, «the supplier» of high qualified work force, «the distributor» of new social-economical and social-cultural praxes, national culture bearer and etc. is being added into it [2].

More often in professional literature the middle class is defined by such basic criteria as:

- educational and income level;
- consumer standards;
- owning of corporeal and intellectual property;
- capacity of highly skilled labor;
- self-identification as the representative of «social middle class».

The presence of «non-material» signs of belonging to the middle class where the maximum value attaches to confidence in the future and warm existence in one's old age, capability to maintain health by receiving qualified treatment seems to be interesting.

Of all the above listed criteria of defining the middle class more disputes and debates accrue to incomes.

According to estimates of the CSR (Centre of Strategic Research) the lower bound that allows to refer the household to the middle class today is the yearly income in the amount of nearly 600 000 rubles per family (20 000 \$). In big cities this income is higher and amounts to 900 000 rubles (30 000 \$). Upper bound of the middle class is the income that amounts to 9 000 000 rubles per family (300 000 \$). But the question about the number of such family members remains opened.

It is worth to notice that the figures are controversial and considerable vary in professional literature.

Definition of creative class corresponds to the similar scopes which are being focused on by the developers of «Strategy 2020» who named it as the

main Russian economic engine. [3] In their opinion this are people of «creative work that in the course of usual work create innovations» «Creative class is able to offer something new to society and unlike the middle class it has higher

According to the data of the CSR in 2011 income greater then 600 000 rubles per family (20 000 \$) had approximately 15 000 000 families and that is 29% of the population. If we consider income of the lower bound of the middle class that amounts to 900 000 rubles (30 000 \$) in a year per family, then following the results of 2011 18% of the population or 9 500 000 families referred to it. The income greater then 9 000 000 rubles (300 000\$) yearly per family had 237 000 families or 0,5% of the population. 29 000 families or less then 0,1 % of the Russian population could make boast of their income of more than 1 000 000 \$ in a year.

Therefore Russia has its own specific middle class other than the western one. Objectively the material criteria between Russian middle class and its European analog varies significantly. However the homegrown middle class fulfills a variety of functions that are essential to develop the society.

Generally the middle class has fairly high level of education and culture and also plays stabilizing role in social-political life of Russia and is capable to express vital interests of strong majority of the citizens.

References

1. Kachalov, electronic resource http://www.iteam.ru/publications/marketing/section_22/article_4038.
2. Middle class in modern Russia / editors-in-chief M.K. Gorshkov, N.E. Tikhonova; Institute of Sociology, Russian Academy of Sciences. – M., 2008. – 320 p. ISBN 978-5-89697-144-3.
3. <http://straegy2020.rian.ru/> electronic resource.
4. <http://www.vestifinance.ru/articles/10018> electronic resource.

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THE HUMAN CAPITAL DEVELOPMENT MANAGEMENT: CHALLENGES, MARKETING TECHNOLOGIES AND PROSPECTS OF THE RUSSIAN MEDICAL EDUCATION

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The economic agents' competitiveness in the knowledge economy is depended and defined by the human capital further development level and the education system. The human resources qual-

ity further improvement is practically being developed under the continuous development conditions, therefore many countries of them are tended to be taken the rightful place in the general planetary labor division, and the global income assignment.

The quality requirements level of the human capital is being increased, which it is implied the human beings' role rethinking in the continuity of the Institutional reforms of the medical education and the relevant changes acceleration conditions, under the knowledge economy level formation, and its further development context conditions. As the society, well as its individuals should be able not only to be adapted to such changes, but also to be anticipated all of them.

So, the human qualitative characteristics are played the special role in the knowledge economy: the knowledge, skills (e.g. the experience gained), qualification, ability to the lifelong learning, self-perfection, and creativity. The worker's personal qualities are played the undeniable role: the versatile development, responsibility, initiative, integrity, and communication skills. Thus, the employee's moral characteristics again have been become their particular significance in the medical world: honesty, conscientiousness, sympathy, empathy, and co-ownership.

The significant investment is required in the medical specialists, and the professionals training and re-training system and the medical education, in general, to be achieved the human factor high quality. The human capital further development management is practically aimed at its quality improvement, the human resources further development, for all this, the power subjects may be acted, as the potential at all the levels and also in all the spheres of the business community, as well as the civil society, in general.

The modern comprehension of the social progress is being concentrated around the man's challenge. The economy's innovation model is practically typical for all the countries, that can be efficiently developed and be used the human capital. The differences strengthening rise between the societies that have their means for their stability strengthening, on the basis of the human capital, is acted by the watershed between the competitive and lagging in their further development countries and also those countries and states, for which the impossibility of the advanced technologies mastering will be constantly put increasingly higher barriers in their further development.

So, the knowledge economy further evolution is practically predicted on the products' and the services' expanding markets concept, in which the knowledge has been become to be acted, as the market products. «The product – knowledge» and «the service – knowledge» are being produced, advertized, sold, and bought at the quite different markets in the same way, as the typical products and the corresponding services. At the same time,

the knowledge and the services product market is practically more complex Institutional formation, than the classical market, which is familiar to the economists.

So, the going to the knowledge economy is generated the challenges, which are raised during the human society further evolution process, and it is reflected the whole imperfection of this process, on one hand, and, on the other hand, it is determined this movement possibility in the framework of the already formed Institutes and the need for the changes to be resolved all these given challenges.

Today, there are a number of the system-leveled and their origin challenges, which are difficultly to be solved or even they are, inherently, accompanied the further development in the presence of the existing basic Institutes and the already formed medical education structure. One gets the feeling, that to address all these crucial challenges the modern society is not trying to be started up or it cannot be found the most efficient recipes. Under all these conditions, the economy image of the medical knowledge, as the model for the future, it can be presented by these challenges presence, as well as by the Institutes, having intended for their successful solution.

To all these challenges, from our point of view, are included the following:

- the long and steady decline in the prestige of the medical professions, that is the public indicator of the health sector sphere situation, which is indicated on the low public satisfaction with the health care system situation;

- the mass graduates schools enrolling in the Medical Institutes of Higher education with their low (e.g. really) ASE points and the complete lack of the motivation, as well as learning ability;

- the students' lack of convincing motivation to be acquired their knowledge intensive, due to the salaries' low level for the medical and health workers;

- «the informational stress», having conditioned by the avalanche-like increase of the scientific and medical knowledge, which are not able to be accommodated the modern man's brain. According to the RF Deputy Minister of Health T.V. Yakovleva's words, the knowledge are being became obsolete, today, at 15% annually, and they are fully updated in 6 years (e.g. 72 months);

- the recruited number of the young teachers is not compensated for the aging process of the faculty body. This is understandable by the material failure of the vacancies offered. The number reducing of the qualified of scientific and pedagogical staff, the reducing demands to the students and trainees has already been led to the alarming situation: «there is nobody to be taught and no one to teach».

So, these challenges solution is quite possible only at the holistic approach using, as all the challenges are interrelated and interdependent, and their resolution should be systemic.

Today, the process of education in the medicine cannot be considered in the isolation from the educational work. It is obvious the fact, that the career – oriented activities should be began from the school, but much better from the kindergarten bench, through «the medical groups», and the classes, where the necessary knowledge and the skills will be presented in the group, and then, in the scientific and practical form. This is the only way to be developed the right system of the value orientations and the ideological positions at the future doctor.

The modern education is the continuous and universal one, so the task of the educational services market operators, having implemented the marketing technologies further development, is to enable a person possibility to be learnt throughout his life. The contemporary medical science dynamism, which continually are risen to the quite new areas of the activity and the professions, is required the constant changes qualifications, the adaptations to the new challenges of further development. Thus, the qualitatively new challenges, having faced before the modern system of the medical education, are required its serious Institutional modernizations.

The marketing instruments and the technologies are made the structure of the diverse educational programs more balanced, which has been made the direct influence on the human capital further development. It is significant to be distinguished the programs for the people without any job experience (e.g. the pre-experience programs), and also the programs for people with the clinical or the scientific work experience (e.g. the post-experience programs) at the programs' formulating and the trainees' selection in the medical education system. For example, in a number of the programs the work experience requirement in the clinic is not quite obvious, however the specialists' competence level identification and the factors accounting, having provided the choice of the training priority forms, have been made the significant influence on the educational programs' content in the medicine.

The marketing tools for the prospects assessing for the education system further development, the professionals' employment and quality are needed to the Advanced Research Scientific Institutions (ARSI) and the Medioprophyllactic Institutions (MPI) for the orientation on the human capital further development. The effective system of the quality assessment of the professionals' retaining of the medical professions is quite needed for these processes' efficiency. Thus, it had been identified the need of the fact, that the professional examination was put beyond the organizational structure of the Medical educational Institution.

The famous Russian medical schools have already been formed and established quite a long time ago, but now, they are forced to be further developed in the globally competitive environment, for all this, the market operators have to be competed for both, as for the teachers, well as for the students.

So, this specific feature of the medical educational services market will be undoubtedly contributed to the new marketing instruments and their techniques further development, having aimed at the market share increasing, and the resources attraction for the further development, especially, the human capital.

At the Russian medical education market, it may be distinguished a number of the factors, having limited the demand for the educational services, the main ones of which are the following: the high cost for this kind of the services in the leading Medical educational Institutions of the country; the low level of the young professionals' welfare; the obvious advantages misunderstanding of the modern knowledge owning, and as well as the isolating inability of the quite necessary knowledge from the giant and fast – growing array of the modern scientific and medical information.

So, the potential consumers of the educational services should be formed their demand for the medical education services, having focused not only on the domestic educational and the scientific organizations. For all this, they must have the good basic training, without which it is quite impossible the adequate mastering and assimilation of the scientific and medical information of the private order.

The students and the graduate students must choose the best stage of the programs of the professionals' training and their retraining at the global and the national markets of the medical education, having taken into account the quality and the cost of the primary and the secondary programs. So, it should be noted, that today, the Russian Medical Institutions, for the most part, do not very eager to have their employees' staff trained in the foreign Medical higher schools.

The domestic medical education emerging market should be gone the way from the foreign specialists' and professionals' attraction, as well as the Medical higher schools to the integrated educational programs to be created. At the present stage of the Russian Medical science further development, we can already recognize the urgent task of the educational services export ensuring, which can be solved, on the basis of the marketing and the organizational management of the human capital further development. Under these circumstances, the marketing instruments and the technologies will be provided not only the competitiveness of the Russian Medical educational programs and the organizations, but also the attractiveness of the Russian Medical educational Institutions for the foreign consumers.

So, the intellectual further development of the countries is quite impossible without the priority investment in the man, science, educational technologies further development, as well as the instruments to be promoted them. The marketing instruments of the human capital further development are being produced in the knowledge economy, and they are acted, as the component of the social further

development, the aim of which is to be created and to be increased the unique knowledge and the new technologies potential on their basis, the products, the processes, having promoted to the economic agents' competitiveness growth.

The changes producers in the knowledge economy are being acted not only the economic agents, but also the Institutions, which are fully included the state educational Institutions of the higher professional education in the field of the medicine and SRI. So, the special area of the given higher education should be considered the programs, as the part of the educational programs, having tailored directly to the needs of the specific Institutes of higher education, the Colleges, the Universities, ASRI or MPI. There are many concepts and the organizational forms of the enterprise program applications: from the training and the consulting programs, having implemented by many Medical Institutes of higher education, the Medical Colleges, the Medical Universities, to the corporate Universities to be created, that can be expanded the sphere of their influence, on the basis of the marketing technologies and the specific instruments.

So, the marketing technologies further development has been made the significant impact not only on the educational system further development in the medicine, but also on the human capital formation, on the basis of the specialized programs and the special courses.

Thus, such programs further implementation and their realization is practically aimed not only the medical personnel's training and retraining, but as well as the specialists' and the professionals' unique medical knowledge and the corresponding competences, and skills formation, having focused on the substantial further development strategy, the intellectual and the human capitals, having allowed to be realized the competitive advantages.

In the Russian Medical Institutions, the Medical Institutes of higher education, the Medical Colleges, the Medical Universities, it has been already accepted to be proud of the education and the competences level of their staff. However, the human capital further development, on the basis of the specialists' and the professionals' training and retraining system is practically needed the marketing management by this process, due to the fact, that it has been noted in the domestic market, firstly, the specialists' and the professionals' excess with their higher Medical education at the paradoxical lack of the highly qualified medical personnel management; secondly, the inability of the modern Medical educational Institutions to be prepared the specialists and the professionals on demand. So, the modern Medical education, as a set of the Medical sciences and disciplines, unfortunately, does not form the proper attitude of the future physician to such significant concepts, as pain, suffering, and death. All these categories, in terms of the axiological and corresponding ethical and deontological filling,

should be achieved and grasped during the training stage mandatory.

In the context of the massive expansion of the modern scientific and medical information, it is seemed appropriate to be revised the curricula for the in-depth study of the basic knowledge, then the mastering of the modern information flows of the Medical scientific data. So, probably, it can be neglected by the intermediate knowledge, which is outdated, inconsistent or have only their historic significance. This approach has been dictated by the finite capacity of the human memory and the brain function, in general. Namely, here, the sustained trend explanation to the vocational guidance «narrowing» in the scientific and medical world, as in our country, well as abroad has been laid.

One of the main marketing instruments of the Russian Medical education further development should be the programs' share expansion in the foreign languages, especially, the English language. The specific feature and its peculiarity of the English – language programs introduction is the audiences' auditorium forming marketing technologies use, that should be the foreign languages speakers. If the students and the teachers are the Russian – speaking ones, then the programs will not be able to be the export – orientated ones.

To the marketing instruments of the international educational environment formation, it may be included the foreign scientists', scholars' and the researchers' attraction technologies, as well as the bilingual design technology diploma on the graduation of the Medical Institute of higher education, the Medical College, the Medical University or the University Medical residency.

Thus, the marketing instruments in the human capital further development and the medical personnel training must be taken into account their further development whole specifics, the focus on the people development at the different hierarchical levels of the medical organizations management, the qualities necessary for the corporate strategy implementation of the consistent and the continuing Medical education. For all this, the marketing instruments are practically allowed to be identified the needs of the Medical Institutes of higher education, the Medical Colleges, the Medical Universities, ASRI and MPI and in accordance with that, to be produced the high quality level in the teaching, having based on the forms and the methods meaningfulness of the specific training programs. Thus, the New times are required the sensibly – centric concept, and this, in its turn, is being dictated the urgent need to be accelerated the further transition to the innovation Medical education.

References

1. Fukuyama F. Our Post – Human Future. – M., 2004.
2. Kutyrev V.A. The Modernization: Against Thoughtless Innovationism – for Controlled Development // The Philosophy of Economy. The Almanac of the Center of the Social Sciences and the Faculty of Economics of Moscow State University (MSU) after M.V. Lomonosov. – 2011. – № 2.

3. Zhizhin K.S. Some Challenges of Higher Medical Education Integration in the European Space // *The Modern Science Intensive Technologies*. – 2010. – № 9. – P. 117–118;

4. Petrov S.V., Balakhonov A.V., Molitvin M.N., Fionik V. The Modern Challenges of Higher Medical Education // *The Bulletin of the Saint – Petersburg University*. – 2006. – Ser.11, vol. 3. – P. 130–141.

5. http://www.dss-school.ru/aksiologicheskoe_vospitanij_studentov_kak_sostavljyushaj.html.

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DEVELOPMENT AND INTRODUCTION OF THE TECHNOLOGY OF CONTROLLING IN ORGANIZATIONS IN THE REPUBLIC OF KAZAKHSTAN

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The analysis of the evolution of approaches and the application of controlling system in foreign countries are given. There are suggested the ways of improving of the quality of management in organizations of Kazakhstan, based on the implementation in practice of management techniques and innovative management.

In a market circumstances due to business growth, complicating the structure of the organization and the subsequent exacerbation of the existing problems in it, there is a need for a new business model. Controlling development in the enterprises of the Republic of Kazakhstan contributes to the formation of the strategic and operational planning, timely calculation of risks and anticipating the challenges and obstacles, and provides transparency of enterprises. In order to solve all the issues involved the new approaches and implementation of advanced management techniques are required. The use of modern management technology, the introduction of theoretical developments and the best management practices are necessary for companies interested in the successful implementation of industrial and innovative projects that improve business performance.

Organizations management is a complex process of realization of management functions. Adaptation of the organization to the conditions of competitiveness is connected to the necessity of carrying out of analysis of the competitors. It is important to evaluate of own potential relatively to the competitors. In this sense a development of the strategy of competitive behavior of the organization on a market and its realization are of great importance [1, 2]. According to H. Fayol's conception the basis of management is five initial functions: planning, organization, mentoring, coordination, control; and the management process is a sum of

all these functions [3]. For Kazakhstan the problem of creation of the effective system of organizations management in the conditions of management in the market circumstances are important as well as for other countries of the post-soviet area. Borrowing of theoretical and practical experience of world competitiveness and development of corporative leaders often find difficulty because of the uniqueness or privacy, absence of information about effectiveness achievement methods. In addition, there are absent the universal schemes of the competitive behavior on the market.

A problem of the strategic management is a permanent orientation and reorientation of all forms of activity of organization in the directions providing its development and effectiveness. The basis of the strategic planning is a forecasting, which is the embodiment of the strategy of the organization on the market and is based on the analysis of the available information with sequential modeling of the possible variants of development of the situations. The important item at the realizing of the forecasting is an acceptance of the fact of stability of the positive dynamics of organizations activity parameters from one reporting period to another [4].

The Kazakhstani entrepreneurship is today on the stage of awareness of the necessity of creation of new model of functioning in the market circumstances. The existing level of quality in many organizations becomes the basic brake for their further development. There is an influence of an absence of the progressive technologies of management and management staff. This causes a weakness of the strategic planning and insufficient effectiveness of the operational management.

The management elements get complicated with an organization's increase: resources, personnel, motivation, and relations between partners, deliveries, orders, allocation, production, technologies, equipment, technical maintenance, data bases, quality, marketing and responses for change of market and legislation, adjustment of conflicts, interests of different groups and persons and etc. [5, 6, 7]. Consequently, for solution of all of the arising questions the new approaches and implementation of the progressive management technologies are required.

One of the new directions in the theory and practice of management, arisen on the base of the interdisciplinary approach (economical analysis and planning, management accounting and theory of management) is a controlling which is applied now in many foreign countries [5, 6, 7].

An analysis of the sources shows that one can distinguish the basic conceptual approaches:

– a conception, the basis of which is the retrospective and forecasting in the system of accounting and creation on the base of account data the support of the management decisions, connected to the planning and the control of organization activity (it got a development in 1930th); its modern interpretation – budgeting, oriented to result (further – BOR);

- a conception, the basis of which is a creation of the general information system of management, its implementation and optimization of the information flows (it got a development in 1970–1980th);

- a conception of the controlling as an element of the management system: coordination and account of difference between the management system and execution system (1980–1990th) [5, 6, 8].

A doctor of economic science, an auditor of the Chamber of accounts of the Russian Federation S. Ryabukhin notes that «in the scientific literature a conception of «financial controlling» is considered as a set of methodologies directed to reducing of the management practice of structural subdivisions and holdings to a construction which is effective for the specific type of business. Consequently, one needs a mechanism which allows with less expenses optimizing the financial and human resources for achievement of the marked aim» [9]. The BOR as a methodological approach to planning and execution of organization budget «realizes a direct regulation of actions *ex ante* that is a preventing of possible damages [10]» and their non-admission. At the same time «the BOR implies a hardening of the responsibility *ex post* that is when there is a possibility to compare the results obtained» and values of the target parameters of the budget of the organization and also of the expended resources [10, 11].

The analysis carried out in the field of controlling allows expanding of the conceptual approach and formulate the author conception. This author conception is directed to an improvement of the system of organization management and its management professionalism increase with strengthening of the role of planning function and activity control of structural subdivisions of the organization. In the system of organization management (management of management) the function of activity coordination is connected to the development of organization structure, project management, delegation of rights and responsibility and etc. A spacing of accents at this can be different, for example, in dependence on the strategic management aims chosen of, a possibility of flexible response for change of external circumstances in operation regime or accent to characteristics and parameters of the internal circumstances of the organization. Such an approach can be realized in the system of management in Kazakhstani enterprises and organizations.

The modern approaches to management distinguish the controlling as a management conception, which covers all the spheres of activity of the organization: organization management, finances and financial account, business accounting, marketing, personnel, production and etc. But the controlling system does not still become customary for the practice of the Kazakhstani enterprises. The necessity of appearing in the domestic organizations of the controlling system and controllers' service can be explained by the following reasons:

- a non-stability of the external circumstances requires a shift of the accent to the analysis of the future state of the organization (an increase of the reaction rate for the changes of the external circumstances);

- a necessity of planning of the system of actions on providing of anticrisis events and creation of reserves for providing of the financial stability;

- an increase of an information flow, in which it is necessary to distinguish the relevant one, and it is required a construction of the special system of management information providing;

- a tendency to integration of different fields of knowledge and human activity, that is account of management synergy.

The strategic controlling uses such methods and instruments as a financial estimation of the strategic plans, scenario analysis, value analysis, strategic management of expenses and other. The instruments of the operational controlling are GAP-analysis, portfolio analysis, comparative analysis, calculation of marginal benefit, value analysis [11].

In addition, the parameters balanced system (PBS) is also referred to the main instrument of the controlling, including personnel evaluation, budgeting and other. But the PBS does not succeed in functioning without effective operative management and its obeying to achievement of the strategic aims.

Kazakhstan during the last decade demonstrated a stable increase of the economy. Today the accents are shifted to the innovation development. The interest to the controlling in Kazakhstan lately arose in connection with the actuality of the anticrisis management. A doctor of economic science, professor S.D. Tashenova (International business academy, Almaty city) on the example of big Kazakhstani production enterprises of petroleum-gas and electro-energetic field shows the effectiveness of use of the methods and instruments of the controlling [12].

A development of the controlling, an elaboration of the methodology and implementation in the organizations and enterprises of Kazakhstan of the system and technologies of the controlling, allows:

- forming and providing of the functioning of the system of flexible strategic and operative planning with account of the arising risks, in addition allowing forecasting and estimating of the effectiveness from investments into innovations operatively;

- coordinating all management subsystems of the organization (enterprise) with each other, orienting them to achievement of aims;

- realizing an adequate calculation of the risks and forecasting of challenges and obstacles which can interfere to the execution of the global and local aims of the organization;

- providing opportune and adequate information support for individuals making decisions;

Benefits from an implementation of the system of the controlling for Kazakhstani organizations are obvious: for state organizations the successful realization of the industrial-innovation projects and increase of their profitability are im-

portant. Private investors, in turn, are interested in an increase of the effectiveness and transparency of public organizations. The public organizations, big and private companies are interested in an application of the modern innovation technologies of management, implementation of theoretical elaborations and advanced management practices. The higher education institutions, business schools, centers for qualification improvement are interested as well as in a study of the advanced experience of the controlling and also in development of programs of professional education, qualification improvement and management staff certification.

References

1. Richard L. Daft. Menedzhment. Uchebnik. – Per. s angl. – SPb.: Piter, 2001. – 832 p.
2. Ivanov A.P. Menedzhment. Uchebnik. – SPb.: «Izd-stvo Mihajlova V.A.», 2002. – 440 p.
3. Meskon M.H., Al'bert M., Hedouri F. Osnovy menedzhmenta. Per. s angl. – M.: Delo, 1992. – 702 p.
4. Druker P. Upravlenie, nacelennoe na rezul'taty: Per. s angl. – M.: Tehnologicheskaja shkola biznesa, 1994. – 228 p.
5. Kontrolling kak instrument upravlenija predpriatiem / E.A. Anan'kina, S.V. Danilochkin, N.G. Danilochkina i dr.; Pod red. N.G. Danilochkinoj. – M.: Audit, JuNITI, 2001. – 279 p.
6. Petrenko S.N. Kontrolling / Uchebnoe posobie. – K.: Nika-Centr, Jel'ga, 2003. – 328 p.
7. Znoeva A.A. Kontrolling i ego rol' v ekonomike // HI Respublikanskaja nauchno-tehnicheskaja konferencija studentov, magistrantov, aspirantov i molodyh prepodavatelej «Tvorchestvo molodyh innovacionnomu razvitiu Kazahstana», Ust'-Kamenogorsk, Kazahstan, 21–22 aprelja 2011. – P. 135–136.
8. Suhareva L.A., Petrenko S.N. Kontrolling – osnova upravlenija biznesom. – K.: Jel'ga, Nika-Centr, 2002. – 208 p.
9. URL: www.uptp.ru.
10. URL: www.issras.ru.
11. URL: www.businesscom.biz.
12. Tashenova S.D. Regional'nyj aspekt razvitija kontrolinga v Respublike Kazahstan // Region: jekonomika i sociologija. – 2007. – № 1. – P. 306–309.

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*Materials of Conferences***RESEARCH OF INNOVATIVE TEACHING METHODS OF BASIC NATIONAL CULTURAL TRADITIONS OF GANJA CITY**

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Today teaching of local craft and national cultural traditions of Ganja on the basis of innovative methods is necessary. Because:

1. In whole Ganja's traditions are leading to spiritual pureness, they are collection of the universe laws to perfection, way of nation.

2. Scientific and archaeological researches have proved that Ganja was cradle of science and culture not only of Azerbaijan, but also of the whole East.

3. Historically, Ganja city has been managed by government agencies, along with the elders. Folklore materials, collected from Ganja and historical information are confirming sayings.

4. Ganja kitchen with its national characteristics is differs from other regions of Azerbaijan. The cooked dishes, prepared sweets, sherbet (sweet drink) are differing for their tasty and manufacturing technology. Ganja has a positive impact on national food composition in the human body, is the health service.

5. In Ganja relationship ties are very strong. It is the tradition of Ganja people to often visit relatives, and to share their sadness and happiness.

Scientific and archaeological researches have proved that Ganja had been the cradle of science and culture not only of Azerbaijan, but also of the whole East. Most of the natural and geographical conditions, plenty water of rivers, fertile land, rich ore deposit, fuel, wood materials used for construction and craftsmanship, colored plants for getting color and natural caves allowed the first people to live in this area in the Late Stone Age [1]. Ganja, that has changed its location at least 4 times since its establishment, is located in a favorable position from the strategic point of view. That why it always has been the center of attention of foreigners [2]. Different facts are good example of that, the urban culture has been on a wide area of Ganjabasar more than 4000 years. In nowadays, when people speak about its historical, geographical location and position they mean the area of Ganjabasar. This area in various stages of the history was named as Ganja-Karabakh beylerbeylik, Elizavetpol province, also Ganjabasar with the center in Ganja. Nowadays, the historical territory of Ganja is also named Ganja-Kazakh economic region or Western region. This area includes Agstafa, Dashkasan, Gadabay, Goranboy, Goygol, Kazakh, Samukh, Tovuz administrative regions, cities Ganja and Naftalan. Ganjabasar

is one of the richest areas from archaeological point of view. As a result of archaeological investigations here were found samples of material culture that concerned to the stages of different history period. Today most of them are kept in various museums of the world.

The flint tools, that found in Gillikdag workshop and camp around Ganja, ladle, that were found by a prominent Azerbaijani archaeologist Isaac Jafarzade, give the reason to say, that people, who lived in this area in VII–VI millennium BC were the founders of the Late Stone Age culture. Archaeological investigations prove that in this period the main population of this region had sedentary lifestyle and were engaged with farming. In V millennium BC in Ganja region all known to us domestic animals were domesticated. This fact is approved with osteology remainders that were found during archaeological excavations. The anonymous author of the article «Russian city» gave the schedule indicating the date of cities of the South Caucasus, also of Azerbaijan. And here he matched, that Ganja was founded in II century BC – IV century AD. The famous Arabian historian and geographical scientist Ibn al-Athir valued Ganja as the hero-city and said: «Tatars (Mongols) after robbing and ruining Beylagan and its around moved to Ganja. But when tatars knew, that its population is big, they have shown bravery in the war with Georgians and the strength of this city, they couldn't go there». Protecting the status of capital city Ganja, in the various stages of the history, had an important role in the preservation of the ancient statehood traditions of Azerbaijan. At the end of the VII century Ganja was the provincial city of Arabs, in the X century the capital of Arran, in the XI century Seljuk's, in the XII–XIII centuries was the residences of Atabek's empire. During this period Ganja had renaissance time of its development, science, culture, trade, crafts reached the highest peak. As a result of scientific researches by the well-known arabist and scientist on Nizami's work Bertels have been proved, that during the terrible earthquake in Ganja in 1139, 3 thousand people died. This fact is reflecting the city's power and greatness again. For comparison, it is also appropriate to note that, in the middle of the XIII century, in the great European city in Paris, lived nearly 100 thousand and in London nearly 40–50 thousand people [3; 4].

Historically, Ganja city has been managed by government agencies, along with the elders. Folklore materials, collected from Ganja and historical information are confirming sayings. Until the middle of the twentieth century, the city was ruled by elders, elders played a role of bridge between the people and official government agencies. The most

important of customs and traditions is forgiveness. During transaction people give each other forgiveness. If the patient going to die also people give him forgiveness and receive from him forgiveness. So they say: «without forgiveness will not be blessed».

Neighborly relations are kept and preserved strictly in Ganja. People don't buy a house, before they interesting in neighbor's character. They say: «Don't buy house, buy neighbor»; «the nearest neighbor to distant relation».

In Ganja relationship ties are very strong. It is the tradition of Ganja people to often visit relatives, and to share their sadness and happiness. «If also relative will eat each other's meat, they won't dispose each other's bone», – they said. In Ganja people mostly pay attention to real-generation, family. If someone wants to marriage his son or daughter, he interests with generation and family of the opposite side. Sometimes, when families can't pliable with each other, they say: «Our bone connected with their bone». When they speak about bone, they mean father's line, about milk they mean mother's line. In this way Ganja people were able to kept and preserved pureness of generation.

Ganja people are very strong in friendship. Also they can die for friend. Friend will pay all the needs of friend, will be his back-support. The equality in friendship is very important: «Show me your friend, and I will say you who you are. Ganja is famous for its hospitality. Most traditions of meeting guest are followed today. For guest in Ganja, as a rule, separated a special room – sitting room. This room is decorated with expensive carpets, put delicate dishes, silk bedding for the guest. For breakfast of guest put cream with honey. For dinner and supper are prepared delicious foods. Among them a plov seasoning with meat and lamb meat kebab are take a special place.

Ganja people put all kinds of table-blessing for guest. In addition they tell to guest kind words, and take to interesting places, worth visiting and pilgrimages. They never ask, when the guest will return. This act shall be considered as disrespect. «The guest is God's guest», – say Ganja people and meet the guest with honor, various gifts and send with respect. One of the more preserved customs and traditions of Ganja, that has deep historical roots, is the tradition of the wedding. Wedding, that full of rites and ceremonies is a whole holiday of elin. In this case, the close people, relatives are more active. The wedding took place in stages girl for so long everyone is happy. In the past there were various games, competitions and races in Ganja weddings. Now, some of these wedding are traditions are forgotten. Ganja didn't have girl's wedding. Instead of it, there was «Parchakesdi» («piece cutting») ceremony. «Parchakesdi» was replaced girl's wedding. And now the tradition of cutting the girl's wedding piece is also preserved. Such traditions as «khinayakhdi», «uchashi», «evgordu» are live on nowadays.

As all the parts of the world, mournful funeral ceremonies in Ganja hold very sadly. Relatives of dead man put on black clothes, don't go to parties for a while, and don't listen to music. The first day of man's dead, third day, seventh day, 40th day and «adna» days (Thursdays) funeral ceremony is continue.

Ganja's funeral ceremonies can't be without rose water. Good smell of rose water eliminates man's pain. When people live funeral ceremony, they give condolences to the owner of mourning.

Also, it is necessary to teach the local national holiday's traditions in Ganja. Khidir Nabi and Novruz holiday in Ganja are celebrated ceremonial. In holiday of Khidir Nabi people roast wheat, and set Khidir's table. Then the flour of roasted wheat people put to secret room. Khidir Nabi comes at night, and put on finger to flour of roasted wheat. In house, which Khidir entered, there will be abundance. Ganja people are going to celebrate Novruz holiday within a month. They keep in order house a, different kind of sweets are prepared. Among them Ganja's pakhlava take more attention. Pakhlava, which consists of nine layers, decorates tables. Eggs are colored; «nazik» (sweet bread) are cooked. Bearing a grudge are reconciled, people visit sick, lonely relatives. People skipped over the bonfire, goes to ear fortune telling, look fortunes in the water, visit and take holiday gifts branded girls, sick, elderly people. In whole Ganja's traditions are leading to spiritual pureness, they are collection of the universe laws to perfection, way of nation.

Ganja and its surrounded territory are also rich with different stones. Presentation of white and in mountain and Aran Karabakh and also lime, travertin and marble building stones in and around Ganja, pure white, a lot of colored aqats, chalsedons, viel, ametist, obsidian, aqats, crystal and other kind of rare colored stones in the river basins of Shahdaq Kecheldag, and other territories created favorable ground for developing in this ancient country from ancient times stone cutting, stone grind, stone polishing and for building great modern, columned, arched, circled and four – cornered buildings here.

Among archaeological equipment there have been found two big boards from stone camel eyes. Base – columns, capitels, that are symbols of irreplaceable art, part of columns, different man monuments, masonry art symbols, that have Ganja, agriculture and religious meaning, especially grave monuments and phalluses, collections of different colored (red, brown, black, grey and other rare colored) stamps and symbols of decorations, that were found in Azerbaijan during archeological investigations prove it.

These rare discovers in and around Ganja are known from the archaeological investigations in ancient cultural, art and trade centers of Azerbaijan, such as Mingachevir, Barda, Baku, Smamakha, Qabala, Ganja, Shatal, Beylagan, Shabran, Khazakh, Qakh, Quba, Qushchu, Shargah, Torpaggala and

other archaeological and architecture complexes. The best samples of monuments, that concern to stone treatment are consists of column props, mill and gridding stones. In whole there were founded in and around Ganja a lot of samoles, that concern to X century. They are consisting of stone figure, mills and colomn props. But stone equipment, found in Ganja, Shamkir and Shatal prepared from mill and candlestick. Mill is usually prepared from volcanic, quartz, limestone and basalt. They used for grinding seed, millet, salt and for other aims [6–8].

We meet mostly mill stones, scales and pumice stone in stone treatment. At the same time there were used hewed stones for decorating buildings. In this period there were prepared decorations from precious stone. In traditional production of cloth manufactory trade historically played an important place. This kind of craft that developed on the basis of local raw materials was tied with cotton-growing economy. Since the time of the early Middle Ages, Ganja as Tabriz, Ordubad have been the main center of Azerbaijan in production of cotton cloth.

In this ancient city printed cotton and calico fabrics have been widely produced. In traditional cloth productions the main place took the urban mines. In the early 30s of the XIX century in Ganja there were more than 164 people – weaving. The majority of these artists were weaving. In Ganja, which was the most important center of cloth production were produced different kinds of cotton cloth. Only in the 30s of the XIX century in Ganja were presently working 30 cloth bench. During

one year this machine were producing 2000 of white cloth, 200 top of red cloth (shile) and nearly 400 benchchalamaya (thin cloth) spoke [8].

References

1. Hasanov E.L. Craftsmanship during the period of Mahsati Ganjavi. – Ganja: Elm (Science Publishers), 2013. – 175 p.
2. Akhmadov F.M. Displacement of Ganja city / Actual problems of history of Ganja. Proceedings of the 2nd scientific conference. – Ganja: Elm (Science Publishers), 2010. – P. 53–63.
3. Guliyeva N.M., Hasanov E.L. About ethnographic-archaeological research of some handicraft branches of Ganja during XIX – XX centuries / Progressive scientific explorations – 2012: Proceedings of the 8th International scientific-practical conference. – Prague: Publishing House – Education and Science s.r.o., Prague (Czech Republic), 2012. – P. 73–75.
4. Azerbaijan ethnography. – Volume I. – Baku: East-West, 2007. – 544 p.
5. Hasanov E.L. Ganja Imamzada tomb (historic-ethnographical research). – Baku: Science and education, 2012. – 268 p.
6. The dawn of Art. – Leningrad: Aurora Art Publishers, 1974. – 196 p.
7. Hasanov E.L. Ganja carpets of the XIX-XX centuries as a historic-ethnographical source / European Science and Technology: Proceedings of the 2nd International scientific conference. – Bildungszentrum Rdk e. V. Wiesbaden (Germany), 2012. – P. 26–27.
8. Sources on history of Azerbaijan. – Baku: Azerbaijan University Publishers, 1989. – 328 p.

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*Materials of Conferences***SEMANTICS OF PROVERBS
IN THE WORKS OF SHERKHAN MURTAZA**

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Sherkhan Murtaza a great Kazakh writer, considered as poetically talented genius of the steppe. In his works Sherkhan Murtaza showed how Kazakh people used the proverbs and sayings. In the language relations the speaker uses the proverbs and sayings to impress the listener; because proverbs and sayings show the genius of the people, their world outlook, and the life experience; The poetical combinations are enough to describe the difficult destiny of the character

Introduction. Sherkhan Murtaza is a great Kazakh writer who can widely show all the expressive word models of Kazakh language in his works; if we say its peculiar feature we are not mistaken. The writer uses all the wealth of Kazakh language effectively, regenerates the uncommon old words, shows their new sides and makes modern combinations.

Having deeply realized the power and the nature of magic words, the poetically talented genius of the steppe Sherkhan Murtaza's works have been considered as the highest peak of working people.

The Main Part. The aim of our article is to determine the proverbial combinations, their use, and the ethno linguistic feature as well as analyze them semantically.

For example: There is a Kazakh proverb «As adamnin arkauy» (Meal is human's weft) There is no part of the body like «weft». It is used in the textile industry. Women in the villages used the weft to make a carpet. If there is no weft there is no perfect carpet.

So the core is a concept like that weft. Something which makes human as a human is the weft, the core; it is a meal [1, p. 175]. The proverb «As adamnin arkauy» (Meal is human's weft.) is given in the connotative meaning; meal helps human to live, like a weft of a carpet, it is nutritious and powerful.

«Asyk oinagan ozar, dop oinagan tozar» (Those who play asyk win, those who play a ball lose) – often says Aisha. I played asyk and lost; I played a ball and lost. While I was playing a ball, I had a problem with the cattle or with zhautik Batyrkhan [1, p. 70].

This proverb's connotative meaning is that it is not right to play different games, instead of it is a good way to live growing cattle, working hard and follow the nomadic way of life. The above mentioned proverb was evaluated by the scientist A. Kaidar: «The proverb is created by the representatives of the ruling class» [2, p. 202].

The writer deeply expressed the difficult life of poor, tired from their sad destiny people: «My

mother Kulykhan's brothers still live in that Bek-tobe. Sali, Kali, Bopetay, Satay ...Ah, haven't seen them for ages». When Murtaza was alive, they had come. «Balapan basymen, turymtayi tusymen» [1, p. 32].

«Balapan basymen, turymtayi tusymen» this proverb means during bustle times everybody wants to save their own lives, to earn for living, difficulties and misfortune of the country didn't unite the people instead it made them run away.

«Akesiz zhetim- arsyz zhetim, sheshesiz zhetim-sherli zhetim» (This proverb means «Orphan without father-impudent orphan, orphan without mother- sorrowful orphan») let's take these lines: «I still remember: in winter bad man was wrapped by his only blanket. Aktamak had a daughter from Sultan named Nauat. The poor girl was hunchbacked. Her spinal column was hurt; she was invalid from the birth. Looking at her nice but sad eyes makes your heart cry... Kuanyshbaay having finished counting the horse:

– Go back-he said. Though it is summer he seems as if he is cold, thin of hunger. It is true that «Akesiz zhetim-arsyz zhetim, sheshesiz zhetim-sherli zhetim» Thanks to God he has a mother, Aisha» [1, p. 109].

The author determines the denotative meaning of this proverb: «Orphan with a father is a real orphan; orphan with a mother is a half orphan». It is usually said that a woman is very strong, hard working, she doesn't show her child the absence of the father; she can work and earn like a man, she can even show the kindness of a father as well as she doesn't allow anybody to give offence her child. Orphan with a mother has clean clothes, is not hungry and feels the orphan hood in half way. While a father can support his child financially can't satisfy spiritually, can't protect his child from bad words and eyes, child always misses mother and really feels the orphan hood. The connotative meaning can be also shown. For example, take my father not my mother, God; I can stay alive even if she knits a cloth. It doesn't mean we can select the importance of the parents; we can't imagine the life without any parent, without mother and father. It is intentional opinion: they say «the importance of a father is as a brother-in law» mother makes much to orphan with no father. «Even if she knits a cloth» means mother has much good for his child; gives food, as well as tidy clothes. With the help of characters' words the author informs the difficult life of the character.

The following poetical combinations are enough to describe the difficult destiny of the character: Kok kempir could read my thoughts. «Shaken has poor life. He doesn't look well. How can he visit his relatives in poor clothes? «Baska tusse baspakshyl» it means, you can't run away from your

destiny». – said Kok kempir pointing to the brown trousers which was shortened by Ziba [1, p. 229].

The proverb «Baska tusse baspakshyl» means when we have difficulties we do our best; we have to deal with everything; with the hardest even the dirtiest thing, (for example producing leather).

«Zhazmyshtan ozmysh zhok», (No fence against a flail or against ill fortune; no flying from fate) because everything happens as Allakh writes on the forehead. This idea is based on the religious belief that human has no power to change his fate.

My grey horse sticking up his ears looked straight at the direction of where his mother went away, put down his head and began to eat grass.

Did he understand that he lost his mother? If yes why didn't he run after his mother? Why didn't he neigh or cry? He sighed heavily and that's all. May be, it is right. If we lose relatives it is a grief. It causes suffering. What good is from it? Having known that «there is no fence against ill fortune» people still break hearts [1, p. 123].

«Kebin kigen kelmeidi, kebenek kigen keledi». «Kebin» it is the shroud the last cloth of dead person, it means he won't come back; the stone cloth «kebenek» (it was worn by the soldiers when they went to the war battle, which was made of strong black felt. It was very proof against arrows.) gave a chance to the soldier stay alive and come back home safely; in its connotative meaning: it is widely used to prove that there is always a chance to return alive from the battle [1, p. 63].

The poor one wants to be rich; the rich one wants to be the god. Poor and rich are opposite words to each other, the writer uses it together in order to express their feature. In this proverb the poor one tells his dream, his wish; the rich one shows his greed. He wants more and more wealth and wants to be the god. It shows the meanness, stinginess [1, p. 39].

«Kop tukirse, kol» this proverb means the collective work is more productive, successful, many people gather and do much work even if they do a little, it gives a good result [1, p. 85].

«Kanagat karyn toigyzar, kanagatsyz zhalgyz atyn soigyzar» this proverb means to be pleased with everything we have at the disposal, teaches us to be patient and satisfied and it presents the wealth to the people. And to be displeased with everything leads to the scantiness, to lose the last chance, even the last horse of the poor man can be killed for food. This proverb teaches to be patient and it is very educative [1, p. 46].

«Ornynda bar onalar» this proverb tells us that after sorrow happiness will come. People share the unhappiness and console «if the man dies his life

is continued by his descendants. (His children, his grandchildren) He has relatives; it means everything will be good when they grow up. Don't despair and calm down» [1, p. 114].

«Tuieni zhel shaikasa, eshkini aspanda kor/kok-ten izde» It means «When the camel is blown by the wind, the goat is already in the sky» Even strong powerful men have difficulties, they can be destroyed by a hard destiny. If they are weak they can be blown. The proverb tells everybody react to the difficulties in different ways: sometimes they are like camels blown by the wind or the goat in the sky [1, p. 183].

Sherkhan Murtaza showed who used these proverbs and how, what for. The above mentioned examples determine the functions of the proverbs and sayings in the texts and conversations. In the language relations the speaker uses the proverbs and sayings to impress the listener; because proverbs and sayings show the genius of the people, their world outlook, and the life experience; they have a great importance. In every debate, arguments or disagreements necessary used proverbs can be undoubtedly base to come to consensus.

Conclusion

Sherkhan Murtaza discovers the denotative meaning of the proverbs and sayings, as well as the changeable (connotative) meaning of them concerning the people. All these polemic words show the language genius of the writer in one hand and the expressiveness of the Kazakh literary language in the other in his works.

Sherkhan Murtaza is a master of artistic word building. Kazakh people are genius orators, talented speakers and Sherkhan Murtaza is a bright representative. Nevertheless proverbs and sayings are mirror of each people, their world outlook, the character and way of being.

They present not only the wealth of vocabulary of the people, their value increase in due course; and they are never-ending treasure. Kazakh proverbs and sayings are source of edification, life experience, intelligence, lucidity.

References

1. Sherkhan M. Moon and Aisha: novel. – Almaty: Zhalyln, 1997. – 256 p.
2. Kaidar A.T. Greatness of People. – Almaty: «Tolganai» press, 2004. – 560 p.

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Materials of Conferences

 ${}^7\text{Li} \rightarrow {}^5\text{He}\{dt\}$ FRAGMENTATION CHANNEL IN THE POTENTIAL CLUSTER MODEL

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Within the two-body at -model for ${}^7\text{Li}$ nucleus the relative motion wave functions in ${}^5\text{He} + d$ channel have been built by using the projecting method in the dynamic potential cluster model. It is necessary to note, that in this calculations the $\{dt\}$ configuration of ${}^5\text{He}$ nucleus has been taken into account. The graphs of obtained ${}^5\text{He} + d$ relative motion wave functions at the various values of the oscillatory parameter of α -particle are presented. S -wave of the relative d - ${}^5\text{He}$ motion wave function, obtained in this work within the $\{dt\}$ configuration of ${}^5\text{He}$ nucleus, doesn't have a node in contrast to the corresponding one obtained earlier within the $\{an\}$ configuration of ${}^5\text{He}$ nucleus. Obtained functions have been used for calculation of the spectroscopic S_d -factors of the deuteron separation from ${}^7\text{Li}$ nucleus. Also the comparative analysis of the obtained spectroscopic S_d -factors with corresponding ones calculated earlier within the $\{an\}$ configuration of this nucleus has been performed.

In the present work the construction of relative motion wave functions (WF) in ${}^5\text{He} + d$ channel with taking into account dt -configuration of ${}^5\text{He}$ nucleus is performed within the dynamic potential cluster model (DPCM) on the basis of projecting technique described in detail in Refs [1–3]. Below, the main stages of construction of mentioned above WF are presented.

To construct ${}^5\text{He}\{dt\}$ relative motion WF it is necessary to calculate the overlap integral:

$$\Phi(\vec{p}) = \langle \Phi_{s_{\text{He}}}(\vec{p}_3), \Phi_d(\vec{p}_5) | \Phi_{7\text{Li}}(\vec{R}) \rangle, \quad (1)$$

where $\Phi_{s_{\text{He}}}(\vec{p}_3)$, $\Phi_d(\vec{p}_5)$, $\Phi_{7\text{Li}}(\vec{R})$ are the WF of ${}^5\text{He}\{dt\}$, d and ${}^7\text{Li}\{at\}$ nuclei, \vec{R} is the relative motion coordinate of α and t clusters, \vec{p}_3 is the relative motion coordinate of d and t clusters, \vec{p}_5 is the np relative motion coordinate, \vec{p} is the relative motion coordinate of ${}^5\text{He}$ and d nuclei. The integration with respect to \vec{p}_3 and \vec{p}_5 leads to the corresponding ${}^5\text{He}\{dt\}$ relative motion WF as a function of \vec{p} variable.

Next, let us comment the model functions used in calculations. For description of ${}^7\text{Li}\{at\}$ nucleus state the following WF is used:

$$\begin{aligned} \Phi_{7\text{Li}} = & \Phi_{000}^{\alpha}(1,2,3,4) \sum_{m_{S_t}, m_p} C_{1/2 m_{S_t} 1/2 m_p}^{00} C_{1/2 -1/2, 1/2 1/2}^{00} \chi_{1/2 m_{S_t}}^{(\sigma)} \chi_{1/2 m_p}^{(\sigma)} \chi_{1 \frac{1}{2} \frac{1}{2}}^{(\tau)}(1,2,3) \chi_{1 \frac{1}{2} \frac{1}{2}}^{(\tau)}(4) \times \\ & \times \Phi'_{000}(5,6,7) \cdot \sum_{M, m_t} \chi_{1 \frac{1}{2} m_t}^{(\sigma)}(5,6,7) \chi_{1 \frac{1}{2} \frac{1}{2}}^{(\tau)}(5,6,7) \cdot C_{1M 1/2 m_t}^{3/2 M_t} Y_{1M}(\vec{R}) \sum_k A_k e^{-\gamma_k \vec{R}^2}, \end{aligned} \quad (2)$$

where $\Phi_{000}^{\alpha}(1,2,3,4)$, $\Phi'_{000}(5,6,7)$ are the internal WF of α -particle and tritium correspondingly, $\chi_{1/2 m_p}^{(\sigma)}$, $\chi_{1 \frac{1}{2} \frac{1}{2}}^{(\tau)}(4)$ are the spin and isospin functions

of proton, $\chi_{1 \frac{1}{2} m_t}^{(\sigma)}(5,6,7)$, $\chi_{1 \frac{1}{2} \frac{1}{2}}^{(\tau)}(5,6,7)$ are the spin

and isospin functions of tritium, $C_{a\alpha b\beta}^{c\gamma}$ are the Clebsch-Gordan coefficients, $Y_{1M}(\vec{R})$ is the angular spherical function.

It is obvious that in this case the projecting of ${}^7\text{Li}\{at\}$ nucleus WF on ${}^5\text{He} + d$ channel affects the internal structure of α -particle, so for our calculation the WF of α -particle is also needed:

$$\Phi_{000}^{\alpha}(1,2,3,4) = \Phi_{000}(\vec{\xi}_1, \vec{\xi}_2) \sum_n D_n e^{-\omega_n \vec{\xi}_3^2} Y_{00}(\Omega_{\vec{\xi}_3}), \quad (3)$$

where $\Phi_{000}(\vec{\xi}_1, \vec{\xi}_2)$ is the internal function of tritium being in the α -particle structure, which has been

obtained in Refs [4, 5] within the resonating group method (RGM).

The state of tritium in ${}^7\text{Li}\{at\}$ structure is described by WF:

$$\Phi_t(\vec{\xi}_4, \vec{\xi}_5) = \sum_{m_2} B_{m_2} e^{-\frac{1}{4} \delta_{m_2} \vec{\xi}_4^2} e^{-\frac{1}{3} \delta_{m_2} \vec{\xi}_5^2} Y_{00}(\Omega_4) Y_{00}(\Omega_5). \quad (4)$$

The WF of ${}^5\text{He}\{dt\}$ nucleus with the total momentum j and its projection m_j may be formally presented in the form:

$$\Phi_{5\text{He}} = \Phi_{000}^t(1,2,3)\Phi_{000}^d(5,6) \sum_{\substack{S_d, M_{S_d}, m'_i \\ M_L, S, M_S}} C_{S_d M_{S_d} 1/2 m'_i}^{SM_S} C_{1 M_L M_S}^{j m_j} \chi_{S_d M_{S_d}}^{(\sigma)}(5,6) \times \\ \times \chi_{1/2 m'_i}^{(\sigma)}(1,2,3) \chi_{T_d M_{T_d}}^{(\tau)}(5,6) \chi_{1/2, -1/2}^{(\tau)}(1,2,3) Y_{1 M_L}(\vec{p}_3) \sum_j C_j e^{-\alpha \rho^2}, \quad (5)$$

where $\Phi_{000}^t(1,2,3)$, $\Phi_{000}^d(5,6)$ are the internal WF of tritium and deuteron in ${}^5\text{He}\{dt\}$ structure correspondingly.

The state of deuteron is described by the following WF:

$$\Phi_{J_d M_d} = \sum_{S_d, M_{S_d}} C_{S_d M_{S_d} 00}^{J_d M_d} \cdot \chi_{S_d M_{S_d}}^{(\sigma)}(4,7) \chi_{T_d M_{T_d}}^{(\tau)}(4,7) \cdot \sum_{i_1} G_{i_1} e^{-\beta_{i_1} \rho^2} Y_{00}(\Omega_{\rho_5}), \quad (6)$$

where J_d , M_d are the total angular momentum and its projection.

To calculate integral (1) it is necessary to perform the direct transformations of relative Jacobi coordinates at the transition from ${}^7\text{Li}\{\alpha t\}$ system to $d + {}^5\text{He}\{dt\}$ system, i.e.

$$\{\vec{R}, \vec{\xi}_1, \vec{\xi}_2, \vec{\xi}_3, \vec{\xi}_4, \vec{\xi}_5\} \Rightarrow \{\vec{p}, \vec{p}_1, \vec{p}_2, \vec{p}_3, \vec{p}_4, \vec{p}_5\},$$

$$\Psi_{\kappa}(\vec{p}) = \sum_{\substack{s_c m_c \\ \kappa m_{\kappa}}} Y_{\kappa m_{\kappa}}^*(\Omega_{\rho}) \cdot C_{3/2 M_{\kappa} m_{\kappa}}^{s_c m_c} C_{S_d M_{S_d} j m_j}^{s_c m_c} R_{d^5\text{He}}(\rho), \quad (7)$$

where κ , m_{κ} are the orbital momentum of $d^5\text{He}$ relative motion and its projection, s_c , m_c are ${}^5\text{He}\{dt\} + d$

and, similarly, back transformations. It is fairly easy to do, so we shall not give these transformations explicitly.

Next, using the projection technique presented in [1–3], we obtain the final form of the clusters relative motion wave function in the channel:

channel spin and its projection, $R_{d^5\text{He}}(\rho)$ is the radial part of the relative motion WF which has the form:

$$R_{d^5\text{He}}(\rho) = \sum_{i, i_1, j, k, m_2, n} G_i G_{i_1} C_j A_k B_{m_2} D_n (-1)^{2s_c} \frac{3}{4} \cdot \frac{\sqrt{(2j+1)} \cdot I_{\kappa}(\rho)}{(\beta_i + \delta_{m_2}/4)^{3/2}} \cdot C_{1010}^{\kappa 0} \times \\ \times \begin{Bmatrix} S & S_d & 1/2 \\ s_c & 1 & j \end{Bmatrix} \begin{Bmatrix} 1 & 1/2 & 3/2 \\ s_c & \kappa & 1 \end{Bmatrix} \begin{Bmatrix} 1 & 1/2 & 1/2 \\ 1 & S & 1/2 \end{Bmatrix}. \quad (8)$$

In expression (8) the integral $I_{\kappa}(\rho)$ at $\kappa = 0$ (S-component) has the following form:

$$I_S(\rho) = \frac{(3\pi)^{3/2} e^{-d_1 \rho^2}}{16(d_2 d_3)^{3/2}} \left[\frac{f_1}{d_2} + \frac{\alpha f_2}{d_3} \right] + \frac{\sqrt{3} \pi^{3/2} \xi f_3}{8(d_2 d_3)^{3/2}} \cdot e^{-d_1 \rho^2} \cdot \rho^2, \quad (9)$$

and at the value $\kappa = 2$ (D-component) it takes the form:

$$I_D(\rho) = \frac{\sqrt{3} \pi^{3/2} \xi f_3}{8(d_2 d_3)^{3/2}} \cdot e^{-d_1 \rho^2} \cdot \rho^2. \quad (10)$$

The obtained relative motion WF in ${}^5\text{He}\{dt\} + d$ channel (7) are plotted in Fig. 1 and 2 at the various values of the oscillatory parameter of α -particle. As it seen from Fig. 1, S-wave of the relative $d^5\text{He}$ motion WF, obtained in this work within the $\{dt\}$ configuration of ${}^5\text{He}$ nucleus, doesn't have a node in contrast to the corresponding one obtained earlier within the $\{\alpha n\}$ configuration of ${}^5\text{He}$ nucleus [6].

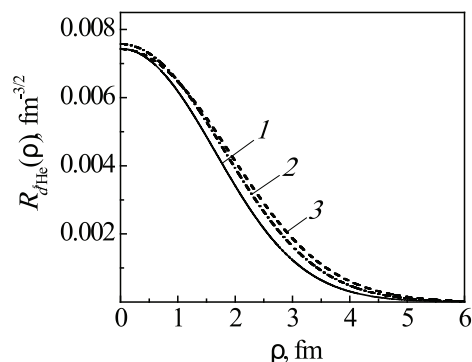


Fig. 1. Relative motion wave functions in ${}^5\text{He}\{dt\} + d$ channel (S-wave), obtained at the various values of the oscillatory parameter r_0 of α -particle: 1 – $r_0 = 1.7$ fm; 2 – $r_0 = 2$ fm; 3 – $r_0 = 2.2$ fm

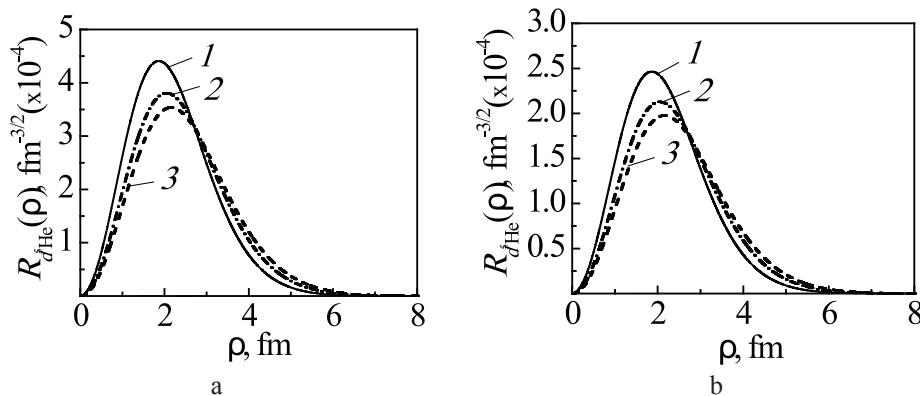


Fig. 2. Relative motion wave functions in ${}^5\text{He}\{dt\} + d$ channel: $D_{1/2}$ – wave (a) and $D_{3/2}$ – wave (b). Curve denotations are the same as in Fig. 1

On the basis of formula (7) it is easy to obtain the formula for calculation of the spectroscopic

S_d -factors of the separation of deuterons from ${}^7\text{Li}$ nucleus:

$$S = \int |\Psi(\vec{\rho})|^2 d\vec{\rho} = (2s_c + 1) \int \left| \sum_{i,j,k,m_2,n} G_i G_j C_k A_k B_{m_2} D_n \cdot \frac{3}{4} \cdot \frac{\sqrt{(2j+1)}}{(\beta_i + \delta_{m_2}/4)^{3/2}} \times \right. \quad (11)$$

$$\left. \times I_\kappa(\rho) \begin{Bmatrix} S & S_d & 1/2 \\ s_c & 1 & j \end{Bmatrix} \begin{Bmatrix} 1 & 1/2 & 3/2 \\ s_c & \kappa & 1 \end{Bmatrix} \begin{Bmatrix} 1 & 1/2 & 1/2 \\ 1 & S & 1/2 \end{Bmatrix} C_{1010}^{\kappa 0} \right|^2 \rho^2 d\rho.$$

The results of theoretical calculations of the spectroscopic S_d -factors in ${}^5\text{He}\{dt\} + d$ channel are presented in Table.

It is necessary to note that presented in Table values of the spectroscopic S_d -factors for ${}^5\text{He}\{dt\} + d$ channel, obtained with taking into account $\{dt\}$ configuration of ${}^5\text{He}$ nucleus, are very small in comparison with the values obtained earlier for ${}^5\text{He}\{un\} + d$ channel in Refs. [7, 8]. As it seen in the present calculations S -wave is dominating,

and weight of D -wave is about $\sim 1\%$. Apparently, this situation is due to the fact that ${}^5\text{He}$ nucleus in the ground state exists only in $\{un\}$ configuration. $\{dt\}$ configuration of this nucleus is more probable only in the first excited state of ${}^5\text{He}$ nucleus ($j^\pi, T = 3/2^+, 1/2$) [9]. Thus, in future it would be urgent to calculate the spectroscopic S_d -factors for ${}^5\text{He}_{exc}^*\{dt\} + d$ channel, when ${}^5\text{He}\{dt\}$ nucleus is in the first excited state.

The results of calculations of the spectroscopic S_d -factors for ${}^5\text{He}\{dt\} + d$ channel, depending on the oscillatory parameter r_0 of α -particle

r_0 , fm	S_0	S_2	$P_S, \%$	$P_D, \%$
1,7	$4,01 \cdot 10^{-4}$	$4,84 \cdot 10^{-6}$	98,8	1,2
2,0	$5,23 \cdot 10^{-4}$	$4,70 \cdot 10^{-6}$	99,1	0,9
2,2	$5,89 \cdot 10^{-4}$	$4,71 \cdot 10^{-6}$	99,2	0,8

References

1. Afanasyeva N.V., Burkova N.A., Zhaksybekova K.A. // Vestnik KazNU. Ser. fiz. – 2011. – № 3(38). – P. 26–31.
2. Burkova N.A., Zhaksybekova K.A., Zhusupov M.A. // Phys. Part. Nucl. – 2005. – Vol. 36. – № 4. – P. 427.
3. Burkova N.A., Zhaksybekova K.A., Zhusupov M.A. // Phys. Part. Nucl. – 2009. – Vol. 40. – P. 162.
4. Vildermut K., Tan Ja. Edinaya teoriya yadra. – Moscow: Mir, 1980. – 502 p.
5. Dubovichenko S.B., Dzhazairov-Kahramanov A.V. // Jad.Fiz. – 1990. – Vol. 51. – P. 1541–1550.
6. Afanasyeva N.V., Burkova N.A., Zhaksybekova K.A., Urazalin A.A. // Vestnik KazNU. Ser. fiz. – 2010. – № 4(35). – P. 3–8.

7. Afanasyeva N.V. // Vestnik KazNU. Ser. fiz. Almaty. – 2011. – № 3(38). – P. 32–35.
 8. Burkova N.A., Zhaksybekova K.A., Urazalin A.A. // Vestnik KazNU. Ser. fiz. – 2011. – № 4(39). – P. 27–34.
 9. Tilley D.R., Cheves C.M., Godwin J.L. et al. // Nucl. Phys. A. – 2002. – Vol. 708. – P. 3–163.

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ONE-NUCLEON SPECTROSCOPY OF NUCLEI WITH $A = 7$

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One-nucleon spectroscopic S -factors and types of nuclei clusterization are discussed. There is carried out a comparative analysis of the spectroscopic proton S_p - and neutron S_n -factors for transition to both the ground and the excited states of the corresponding nuclei-residues ${}^6\text{Li}$ - ${}^6\text{He}$ calculated within the two-body at -model of ${}^7\text{Li}$ nucleus with new accurate results of theoretical calculations of the spectroscopic S -factors for ${}^7\text{Li} \rightarrow {}^6\text{He} + p$ channel obtained within the shell model and also by using of variation methods of Monte-Carlo. For construction of the virtual tritium cluster ${}^3\text{H}$ the following models of wave functions have been used: the translational-invariant shell model which corresponds to the symmetric wave function of the relative coordinates, which has a free variable oscillatory parameter r_0 , and also «realistic» wave functions which are variation functions the parameters of which are chosen to reproduce the observable form-factor of tritium nucleus ${}^3\text{H}$.

The important problem in the theoretical analysis of the nuclear-physical processes is the finding of the correct form of the wave functions of the nuclei participating in the interaction being considered. Since it is possible only in the framework of the definite models, then it is preferably to use the model representations reproducing as much as possible wide spectroscopic information about nuclei. Now the many-particle shell model (MSM) is the more complete and developed one for the light nuclei [1]. The experience of MSM use showed that its application was justified when considering the processes covering the interior of nuclei. At investigating of the peripheral processes, particularly, the reactions of nuclei photodisintegration, the disadvantages of the MSM use appear to be obvious and they are connected with an incorrect asymptotics of the wave functions, i.e. with too fast decrease at large distances.

When considering the peripheral processes the more acceptable are the potential cluster models (PCM), the wave functions of which have a correct asymptotics [2]. In addition, exactly the peripheral processes dominate in the range of low and super-low energies of interaction, which are paid still an increasing attention now, for example, the problem of nucleosynthesis of neutron-deficient p -nuclei. In a whole, a study of the structure of the light nuclei including low-energetic near-threshold photonucleon (γ, N) reactions has a connection to the nuclear astrophysics, and also to the applied thermonuclear physics.

One-nucleon characteristics of nuclei such as the spectroscopic S -factors, reduced widths θ^2 , partial widths Γ , and impulse distribution of nucleons are the important element for investigation of reactions, where one nucleon's separation or joining to target-nucleus occurs. Such ones are the direct nuclear reactions of stripping and pickup, the reactions of elastic and inelastic scattering of nucleons on the nuclei, the resonance reactions with an excitation of the high levels of the compound nucleus and with their consequent decay by one-nucleon channel.

Nowadays for the nuclei of $1p$ -shell the various experimental data are accumulated. The study of the one-nucleon characteristics in the light nuclei was began with reactions of deuteron stripping and nucleon pickup as (d, p) , (d, n) , (p, d) . The mechanism of these reactions is well established: this is either the nucleon transfer from the slightly bound deuteron to the target-nucleus, i.e. stripping reaction, or a pickup of the proton or neutron by the projectile nucleon from the target-nucleus, for example (p, d) and (n, d) . It was further shown that the similar simple polar mechanism is the dominant on a series of other direct processes as $({}^3\text{He}, \alpha)$, (d, t) , $(\alpha, {}^3\text{He})$, (t, d) and etc. The fundamental structural characteristic in all these reactions is the spectroscopic S -factor establishing a connection between different states of the neighboring nuclei. The similar structural information can be obtained in the reactions of quasi-elastic knockout of nucleons by the projectile protons such as $(p, 2p)$ and (p, pn) , and also by electrons $(e, e'p)$. The experiments on quasi-elastic knockout of nucleons from nucleus by electrons, carried out on the Holland accelerator NIKHEV last years, are characterized with high energetic resolution ($E \approx 0,1$ MeV), that allows to study transitions to the separate levels of the nuclei-residues (see, for example, review [3] and the literature cited in this ref.).

During the 80–90th a group of theorists created the dynamic model of the light nuclei [4–8], which the first time allowed to describe the structure of ${}^6,7\text{Li}$, ${}^6\text{He}$, ${}^7,9\text{Be}$, ${}^9\text{B}$ nuclei, and properties of their excited states and probabilities of the different processes on them. For the first time the characteristic geometric forms were predicted, and these

forms were subsequently discovered in the experiments in Kurchatov Institute of Atomic Energy.

According to the multicluster dynamic model with Pauli projection (MDMP) a nucleus consists of a few clusters, in each of which there are no more than 4 nucleons. The Pauli principle is taken into account effectively via introduction of the deep attractive cluster-cluster potentials with forbidden states or via introduction of the repulsive core [4–8].

Let's note, that in the case of describing of ${}^7\text{Li}$ nucleus in at -representation on the base of the simple binary models with using of the deep attractive cluster-cluster potentials with the forbidden states (PFS) practically all statistical characteristics of this nucleus such as the binding energy, charge and magnet radii, quadrupole moment and etc. can be successfully reproduced [3].

In work [9] there was suggested to distinguish the static and dynamic clusterizations of nuclei. Such an approach, from our point of view, is the most effective and further in the process of work in this direction this suggestion can be considered as a conception.

Let us consider the types of clusterization. For example, ${}^7\text{Li}\{at\} \rightarrow \alpha + t$ fragmentation channel corresponds to the static type of clusterization when the initial cluster configuration does not differ from the clusterization of the final channel. In the case of consideration of decays into ${}^7\text{Li}\{at\} \rightarrow {}^6\text{He}\{ann\} + p$, ${}^7\text{Li}\{at\} \rightarrow {}^6\text{Li}\{ad\} + n$ channels, which are associated to destroying (or «reconfiguration») of the tritium cluster, then one talks about the dynamic clusterization. In this case the situation, from one hand, gets significantly complex, and from the other hand the new possibilities for the investigation of the spectroscopy of these channels, peculiarities of the dynamic and static characteristics of the constituent cluster t , which, in principle, can differ from the corresponding characteristics of the free tritium nucleus ${}^3\text{H}$, are appeared. It is worth to note, that a study of the dynamic type of clusterization [9] require new theoretical approaches as well as search for possibilities of the experimental test of the conception being developed. Exactly in this context there is a detailed discussion of the results of the experimental measurements of the process of quasi-elastic knockout of protons ${}^7\text{Li}(e, e', p){}^6\text{He}$ on the apparatus NIKHEF [10].

An example of the intermediate clusterization is a decay into the channel ${}^8\text{Li}\{atn\} \rightarrow {}^7\text{Li}\{at\} + n$, when the constituent cluster does not destroy (as in the case of the static clusterization), but in the process of fragmentation only one degree of freedom is involved but not all of its as it were in the case of the dynamic clusterization.

In works [2, 3] there was considered a mathematical method of construction of wave functions (WF) of the relative motion in the channels of fragmentation, in which the initial cluster function

does not coincide with the type of clusterization in the final channel, i.e., the projecting method. For ${}^6\text{Li}\{at\} \rightarrow {}^7\text{He} + p$ channel the proton spectroscopic factors $S_{0^+,1}$ and $S_{2^+,1}$ for the transition to the ground and the first excited states of the nucleus ${}^6\text{He}$ have been calculated. At this the following variants of construction of the virtual tritium cluster ${}^3\text{H}$ were considered: the translational-invariant shell model (TISM), which corresponds to the symmetric WF of the relative coordinates and has a free variable oscillatory parameter r_0 , and also «realistic» WF, which are the variation functions the parameters of which are chosen to reproduce the observable form-factor of ${}^3\text{H}$ nucleus. In case of TISM the sizes of ${}^3\text{H}$ cluster can be varied using the parameter r_0 , simulating the «diffuse» or «compressed» cluster. In the second case the root-mean-square sizes of ${}^3\text{H}$ are fixed and correspond to the parameters of free tritium.

In Table there is a comparison of the results on the proton spectroscopic S -factors obtained by using the shell model (SM) [1] and the variation method of Monte-Carlo [10] with the available experimental data on neutron S -factors, which have been recalculated into the proton spectroscopic factors using the model-free relation $S_p/S_n = 2$ obtained and justified in [3].

In Table there are also theoretical and experimental values on neutron spectroscopic S -factors for ${}^7\text{Li} \rightarrow {}^6\text{Li} + n$ channel with the transitions to the ground (1^+ , 0) and the first excited state (3^+ , 0) of ${}^6\text{Li}$ nucleus. A comparison of the experimental spectroscopic S -factors for ${}^7\text{Li} \rightarrow {}^6\text{He} + p$ channel shows that the data [13, 14, 20] are in good agreement with each other, but they contradict to the experimental results of NIKHEV [10], and also to values of [12, 18]. The reason of such a difference of the experimental measurements results is quite the difference of the methodology of extracting of S -factors from the experimental cross sections.

In Table there are also the defined more exactly results of theoretical calculations of the spectroscopic S -factors for ${}^7\text{Li} \rightarrow {}^6\text{He} + p$ channel obtained within the shell model [17], and also by using of two variation methods of Monte-Carlo: VMC and GFMC (Green Function Monte Carlo) [16]. As it is seen, in this case the model calculations also differ from each other. So, for example, the results of theoretical calculations of S_p -factors [10, 15, 16] are in good agreement with the experimental data of NIKHEV [10] and [12, 18], while the theoretical values [1, 11, 17] agree with the experimental results of [13, 14, 20]. From Table 1 it is also seen, that in calculations [3] in a whole one can achieve an agreement with those or other data at the expense of variation of the oscillatory parameter r_0 .

Thus, to ascertain the differences between the available values on the spectroscopic S -factors it is necessary to carry out the systematic analysis of the available experimental data.

Spectroscopic neutron and proton factors in isobar-analogous channels ${}^7\text{Li}_{g.s.} \rightarrow {}^6\text{Li} + n$ and ${}^7\text{Li}_{g.s.} \rightarrow {}^6\text{He} + p$

J^π, T	$0^+, 1$		$2^+, 1$		$1^+, 0$	$3^+, 0$
$A = 6$	${}^6\text{Li}$	${}^6\text{He}$	${}^6\text{Li}$	${}^6\text{He}$	${}^6\text{Li}$	${}^6\text{Li}$
$E_{g.s.}, \text{MeV}$	3,563	g.s.	5,37	1,797	g.s.	2,186
$S_{\text{theor}}^n [1]$	0,285	0,571	0,208	0,416	0,804	0,593
$S_{\text{theor}}^p [11]$		0,56		0,34		
$S_{\text{exp}}^n [12]$	0,24	0,48*	0,14	0,28*	0,87	0,67
$S_{\text{exp}}^p [13]$	0,31*	0,62	0,165(0,16)*	0,37 (0,32)		
$S_{\text{exp}}^n [10] \text{ NIKHEF}$	0,21*	0,42(4)	0,08*	0,16(2)		
$S_{\text{exp}}^p [14]$	0,3*	0,6	0,2*	0,4		
$S_{\text{VMC}}^{\text{theor}} [10; 15]$		0,41		0,19		
$S_{\text{VMC}}^{\text{theor}} [15]$	0,221 (I)** 0,183 (II)**	0,442 (I)** 0,365 (II)**		0,274 (I)**	0,709 (I)** 0,612 (II)**	0,500 (I)** 0,436 (II)**
$S_{\text{SM}}^{\text{theor}} [17]$	0,345	0,691		0,466	0,841	0,646
$S_{\text{GFMC}}^{\text{theor}} [16]$	0,203 (I)** 0,204 (II)**	0,406 (I)** 0,409 (II)**			0,668 (I)** 0,657 (II)**	0,435 (I)** 0,447 (II)**
$S_{\text{exp}}^n [18]$	0,19(3)	0,44(6)			0,74(11)	
$S_{\text{exp}}^p [19]$					0,73 \pm 0,05	
$S_{\text{exp}}^n [20]$			0,231		0,43	0,72 (14)
$S_{\text{exp}}^p [21]$						0,58 (13)
$S_{\text{theor}}^n, r_0 = 1,3$	0,224	0,461	0,146	0,291		
$S_{\text{theor}}^n, r_0 = 1,67$	0,286	0,581	0,168	0,334		
$S_{\text{theor}}^n, r_0 = 2,36$	0,228	0,456	0,111	0,219		

Notes: * Experimental data recalculated with regard to the relation $S_p/S_n = 2$ [3];

** I – calculations with the shell model WF; II – calculations with cluster WF [16].

References

1. Boyarkina A.N. Structura yader $1p$ -obolochki. – M.: MGU, 1973. – 62 p.
2. Burkova N.A., Zhaksybekova K.A., Zhusupov M.A. Potential Theory of Cluster Photodisintegration of Light Nuclei // Physics of Particles and Nuclei. – 2005. – Vol. 36, № 4. – P. 427–467.
3. Burkova N.A., Zhaksybekova K.A., Zhusupov M.A. One-nucleon spectroscopy of light nuclei // Phys. of Part. and Nucl. – 2009. – Vol. 40, No. 2. – P. 162–205.
4. Smirnov Yu.F. Nekotorye voprosy sovremennogo sostoyaniya modeli obolochek // Izv. AN SSSR. – 1974. – Vol. 38, № 8. – P. 1627–1638.
5. Ishkhanov B.S., Kapitonov V.N., Orlin V.N. Modeli atomnykh yader. – M.: Izd. Moskovskogo universiteta, 1997. – 155 p.
6. Neudachin V.G., Smirnov Yu.F. Zapreshennyye sostoyaniya v sistemakh iz dvukh i trekh sostavnykh chastiz // V kn.: Sovremennyye problemy optiki i yadernoi fiziki. – Kiev: Naukova Dumka, 1974. – P. 225–241.
7. Kukulin V.I., Neudatchin V.G., Smirnov Yu.F. Microscopically substantiated local optical potentials for scattering of light nuclei // Nucl. Phys. A. – 1975. – Vol. 245, № 3. – P. 429–443.
8. Kukulin V.I., Neudatchin V.G., Smirnov Yu.F. Vzaimodeistvie sostavnykh chastiz i prinzip Pauli // ECHAYA. – 1979. – Vol. 10, vyp. 6. – P. 1236–1293.
9. Chuvil'skiy Yu.M., Ryzhykh G.G. Spectroskopicheskiy faktor kanala ${}^6\text{Li} \rightarrow \alpha + d$ v $\alpha + 2N$ -modeli s antisimmetrizatsiyey // Izv. RAN. Ser. fiz. – 1990. – Vol. 54, № 11. – P. 2276–2280.
10. Lapikas L., Wesseling J., Wiringa R.B. Correlations in the ground state wave function of ${}^7\text{Li}$ // Nucl. Phys. A. – 2000. – Vol. 663–664. – P. 377–380.
11. Barker F.C. Intermediate coupling shell-model calculations for light nuclei // Nucl. Phys. – 1966. – Vol. 83. – P. 418–448.
12. Ajzenberg-Selove F. Energy levels of light nuclei $A = 5-10$ // Nucl. Phys. A. – 1988. – Vol. 490. – P. 1–225.
13. Brady F.P., King N.S.P., Bonner B.E. et al. ${}^6\text{Li}(nd){}^5\text{He}$ and ${}^7\text{Li}(nd){}^6\text{He}$ with 56.3 MeV neutrons // Phys. Rev. C. – 1977. – Vol. 16, № 1. – P. 31–41.
14. Sakuta S.B., Novatskiy B.G., Stepanov D.N. i dr. Eksperimental'noe issledovanie vysokovozbuzhennykh sostoyaniy yader ${}^5\text{He}$ i ${}^5\text{Li}$ v reakciyakh odnonuklonnogo podkhvata (${}^6\text{Li}$, ${}^6\text{Be}$) i (${}^6\text{Li}$, ${}^7\text{Li}$) // YaF. – 2002. – Vol. 65, № 10. – P. 1819–1825.
15. Lapikas L., Wesseling J., Wiringa R.B. Nuclear structure studies with the ${}^7\text{Li}(e, e'p){}^6\text{He}$ Reaction // Phys. Rev. Lett. – 1999. – Vol. 82, № 22. – P. 4404–4407.
16. Brida I., Pieper Steven C., and Wiringa R.B. Quantum Monte Carlo calculations of spectroscopic overlaps in $A \leq 7$ nuclei. // <http://arXiv:1106.3121v1> [nucl-th] 15 Jun 2011.
17. Cohen S. and Kurath D. Spectroscopic factors for the $1p$ -shell // Nucl. Phys. A. – 1967/ – Vol. 101, № 1. – P. 1–16.

18. Wuosmaa A. H., Schiffer J. P., Rehm K. E., et al. Structure of ${}^7\text{He}$ by proton removal from ${}^8\text{Li}$ with the $(d, {}^3\text{He})$ reaction // Phys. Rev. C. – 2008. – Vol. 78 041302.

19. Jun S., Zhi-Hong L., Bing G. et al. Neutron spectroscopic factors of ${}^7\text{Li}$ and astrophysical ${}^6\text{Li}(n, \gamma){}^7\text{Li}$ reaction rates // <http://arXiv:1001.4329v1> [nucl-ex] 25 Jan 2010.

20. Li T.Y. and Mark S.K. DWBA analysis of ${}^6\text{Li}(p, d){}^5\text{Li}$ and ${}^7\text{Li}(p, d){}^6\text{Li}$ reactions at 100 MeV // Nucl. Phys. A. – 1969. – Vol. 123. – P. 147–160.

21. Towne I.S. A DWBA analysis of (p, d) reactions on light nuclei at 156 MeV // Nucl. Phys. A. – 1969. – Vol. 126. – P. 97–114.

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METHODS FOR STUDYING MODES OF SELF-OSCILLATING SYSTEMS

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This article describes the results of the simulation of the generator oscillations in the Advanced Design System (ADS). ADS system contains all the functions that are necessary for the development and design of analog and digital radio devices, only the signal chain devices, wired or wireless, design and routing of printed circuit boards, the development of monolithic integrated circuits and three-dimensional electromagnetic structures. This system is good to use when organizing specialized labs on computer modeling of the technical subjects. We use ADS for simulation of chaos generators.

Introduction. Chaotic signals have the most information capacity, that is, their information entropy is maximized. This property of chaotic signals making them the most promising for the broadband wireless communication [1, 2]. As the systems that produce chaotic oscillations using nonlinear dynamic circuits, such as a generator Chua, the generator Pikovsky-Rabinovich [3], a generator with inertial nonlinearity Anisichenko-Astakhov [4] and many other schemes. In this paper we present some results on the construction of the electronic circuit of the generator dynamic chaos (GDH) in the specialized program Advanced Design System (ADS) [5].

Advanced Design System

Advanced Design System is the world's leading electronic design automation software for RF, microwave, and high speed digital applications. Here are some of ADS analysis:

– DC analysis: is used for determining the bias point of the circuit.

– Transient analysis: runs the time domain analysis on the circuits and considers the nonlinearity of the elements.

– AC analysis: runs the small signal analysis and use the linear model of elements on their bias point.

So the nonlinear elements like transistor are replaced by a linear model (small signal circuit) which includes resistors, capacitors, inductors and voltage & current sources.

– S_parameters analysis: calculates the Scattering parameters of the components, and shows the variation of the S_parameters over different frequencies. It is also used for calculating noise figure and group delay.

Fig. 1 shows the structure of the system ADS.

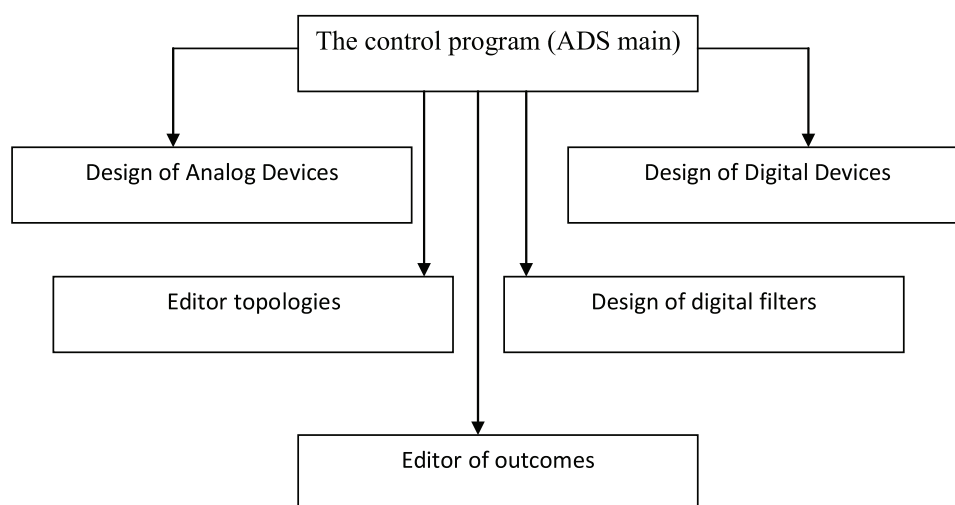


Fig. 1. Structure of the system ADS

Design of analog devices is provided by the subsystem *RFIC Designer*, the main features of which are:

- designing various classes of analog devices (mixers, amplifiers, filters, PLL, etc.);
- the use of different modeling techniques – the harmonic balance analysis on the AC and DC power, the analysis of S-parameter analysis method Circuit Envelope etc.

Design of digital devices is provided by the subsystem *DSP Designer*. The main features of the subsystem are:

- designing different classes of digital devices;
- the use of more than 900 models of functional blocks;
- co-simulation with analog RF devices;
- a user from creating their own models and their inclusion in the library of elements;
- the use of models for hardware description languages;
- synthesis of digital filters;
- library for modeling digital communication systems: GSM, CDMA, W-CDMA, EDGE, W-LAN, etc.;
- testing capabilities;

– getting VHDL and Verilog descriptions for the original scheme;

- ability to design digital filters;
- integration with Altera, Xilinx, Mentor Graphics, Texas Instruments, MatLab.

All design work must be done in a project directory. Working in project directories enables you to organize related files within a predetermined file structure. This predetermined file structure consists of a set of subdirectories. These subdirectories are used in the following manner:

- networks contains schematic and layout information, as well as information needed for simulating;
 - data is the default directory location for input and output data files used or generated by the simulator;
 - mom_dsn contains designs created with the Agilent EEsof planar electromagnetic simulator, Momentum;
 - synthesis contains designs created with DSP filter and synthesis tools;
 - verification contains files generated by the Design Rule Checker (DRC), used with Layout.
- In Fig. 2 shows the front page ADS.

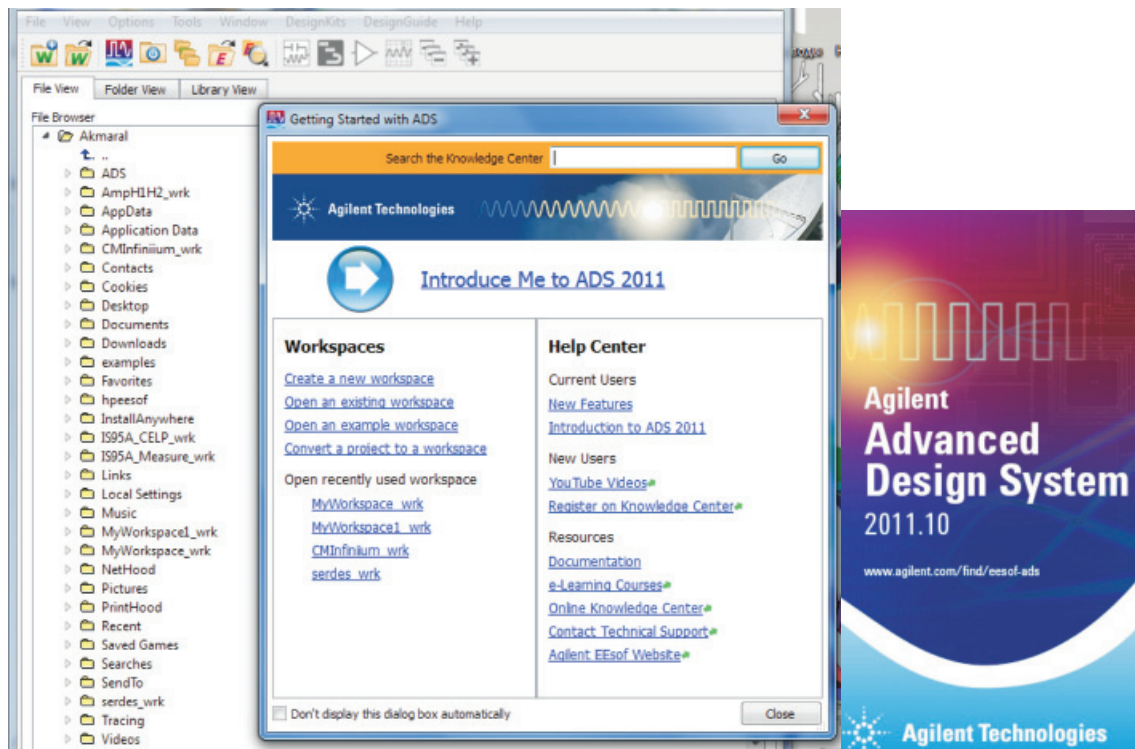


Fig. 2. A front page ADS

Assembly of electronic circuit diagram generator

Develop a model for the simulation of the microwave generator in the ADS package is to assemble the oscillator circuit, when we select the type

of transistor, specify parameter, values resistor, capacitors and inductors [6].

The typical structure of the generator of chaotic oscillations consists of active and passive elements. As an active member protrudes oscillators with one

freedom, usually in such oscillators chaotic oscillations do not occur. Passive oscillator is the second element of the structure. It also contains both linear and nonlinear elements with frequency selective properties. In general, the system began to generate chaotic oscillations when it must have at least 1,5 freedom.

The object of investigation is taken oscillator with an active element of the three-point scheme [27]. At microwave frequencies in the package ADS collected three points generator circuit shown in Fig. 3.

We have modeled such a generator and got the frequency response. In Fig. 4 shows the frequency response of the generator.

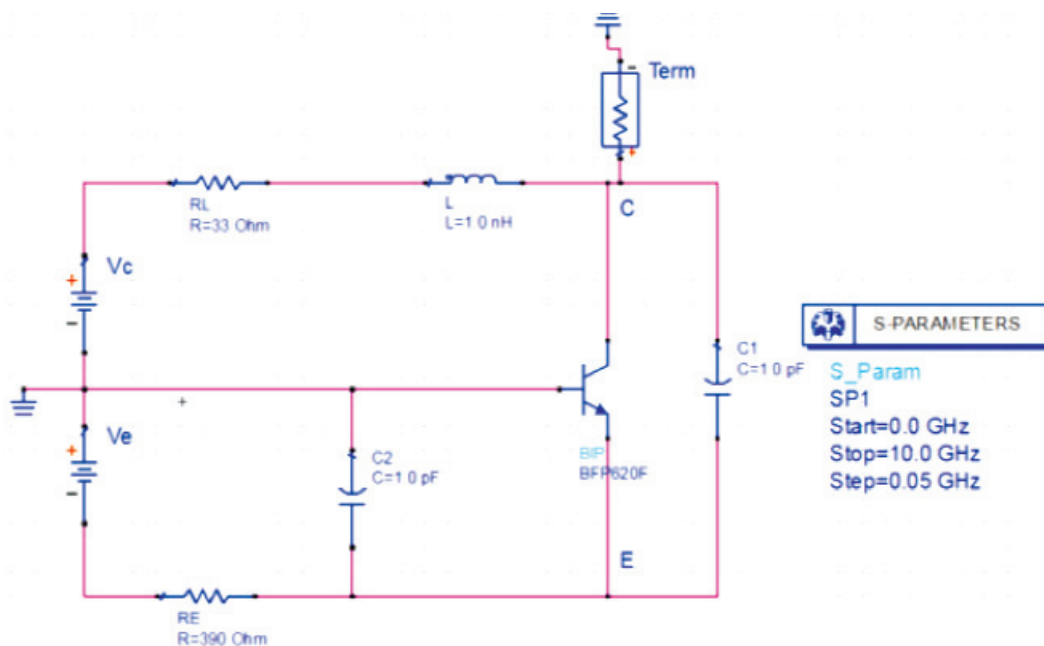


Fig. 3. The oscillator circuit of three points

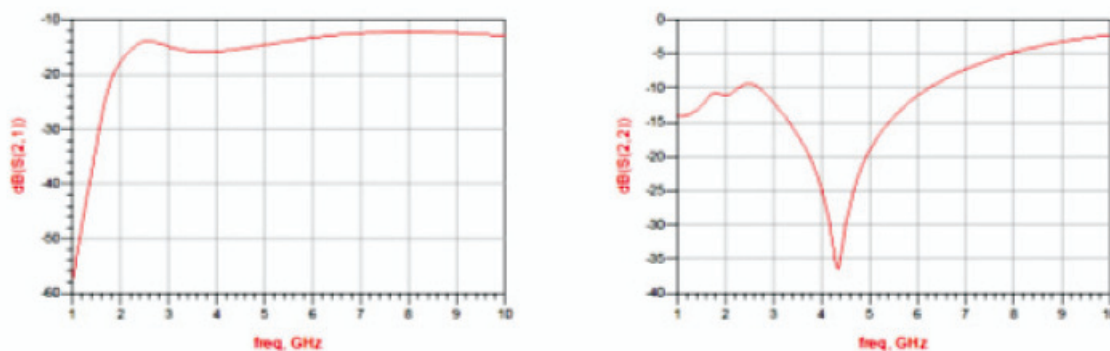


Fig. 4 shows the frequency response of the generator

The graphs show that a generator circuit can be regarded as a low pass filter, activated bipolar transistor.

References

1. Brian B.Z. and Roy R. Isochronal Synchrony and Bidirectional Communication with Delay-Coupled Nonlinear Oscillators // Phys. Rev. E. – 2007. – Vol. 75. – P. 026205 (5p.).
2. Dmitriyev A.S., Panas A.I. Dinamicheskiy kaos: novyye nositeli informatsii dlya sistem svyazi. – M.: Izd-vo fiz.-mat. lit-ry, 2002. – 252 p.

3. Anishchenko V.S. Slozhnyye kolebaniya v prostykh sistemakh: Mekhanizmy vozniknoveniya, struktura i svoystva dinamicheskogo khaosa v radiofizicheskikh sistemakh. – M.: Izdat. grupp URSS, 2009. – 320 p.

4. Anishchenko V.S., Astakhov V.V., Neiman A.B., Vadivasova T.E., Schimansky-Geier L. Nonlinear Dynamics of Chaotic and Stochastic Systems. – Springer, 2002. – 544 p.

5. EM Simulation Advanced Design System 2011. – Santa Clara, USA, 2011. – 162 p.; <http://www.home.agilent.com/en/pc-1297113/advanced-design-system-ads?cc=US&lc=eng>

6. Dmitriyev A.S., Yefremova Ye.V., Khilinskiy A.D. Printsipy komp'yuternogo modelirovaniya tranzistornykh generatorov khaosa v pakete ADS (Advanced Design System) // Preprint IRE RAN, 2003. – № 5. – 633 p.

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MULTICLUSTER STRUCTURE OF ${}^9\text{Be}$ NUCLEUS

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The ground and excited states of the ${}^9\text{Be}$ nucleus are considered in this work. Spectroscopic factors of deuterons and tritons in the ${}^9\text{Be}$ nucleus for different states of the nucleus are calculated. The account of the states with Young [441] diagrams in the pickup reaction of tritons and deuterons by the nuclei ${}^6\text{Li}$ and ${}^7\text{Li}$ respectively enriches significantly the excitation spectra in the lithium transfer reactions.

The ${}^9\text{Be}$ nucleus has a specific nuclear structure. Unlike lighter nuclei from a deuteron to ${}^8\text{Be}$ whose wave functions in the shell model are more than 95% characterized by one predominant configuration, the ${}^9\text{Be}$ nucleus contains no explicitly singled out components. In the many-particle shell model, the wave function of the ground state is composed of 13 components [1], the total contribution of the two components with the [441] Young diagram reaching approximately 96%. The contribution of the states having the [432] Young diagram does not exceed three per cent. It is quite obvious that the predominant configuration of the ${}^9\text{Be}$ nucleus is the αn model [2]. It is this model that best describes the properties of the ${}^9\text{Be}$ nucleus. Only this model yields an apt description of the (γ, p) , (γ, d) , and (γ, t) photonuclear processes on the ${}^9\text{Be}$ nuclear [3] and the hadron elastic scattering reactions at low transmitted pulses [4]. It should be noted that like in the many-particle shell model, the wave function of the ground state in the $2\alpha n$ model is characterized by three components making approximately equal contributions. The shell configuration with the [432] Young diagram corresponding directly to the $\{\alpha t d\}$ cluster decomposition correlates to higher excitation energies [1]. At the same time, it was suggested in [5] that the indicated states with the [432] Young diagram be searched for in lithium transfer reactions of types ${}^7\text{Li}({}^6\text{Li}, \alpha){}^9\text{Be}$ and ${}^6\text{Li}({}^7\text{Li}, \alpha){}^9\text{Be}$ (see Fig. 1).

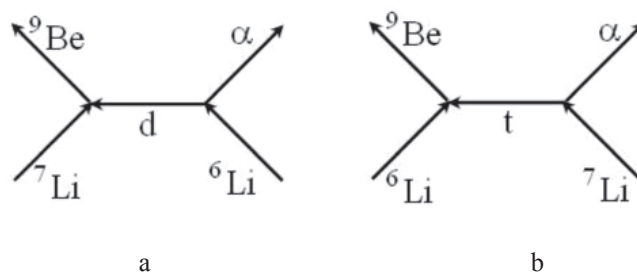


Fig. 1. Diagrams, illustrating the reactions of direct transfer of deuterons (a) and tritons (b) on lithium nuclei

Owing to the low binding energy of ${}^7\text{Li}$ in the $\alpha + t$ channel and of ${}^6\text{Li}$ in the $\alpha + d$ channel, the predominant mechanisms are in both cases the transfer of the deuteron and triton clusters, respectively. The flexibility of the many-particle shell model, however, is that the [441] Young diagram presumes deuteron and triton escape, since (according to Littlewood's rule) decompositions $[441] \rightarrow [43] + [2]$ and $[441] \rightarrow [42] + [3]$ are possible [5]. For a more comprehensive description of the above mentioned lithium reactions, not only the states of the ${}^9\text{Be}$ nucleus with the [432] Young diagram must be considered, but also the states with the [441] diagram. The spectroscopic factors in the ${}^6\text{Li} + t$ and ${}^7\text{Li} + d$ channels including both the [441] and [432] Young diagrams were calculated by the authors. In the transfer reactions, the excitation cross section σ of the levels of the re-

sidual nucleus (${}^9\text{Be}$ in this case) can be represented by the expression $\sigma \sim (2J+1) \sum_L S_L \cdot \Phi$ assuming

a direct mechanism in which S_L are corresponding spectroscopic factors and Φ is a factor depending on the kinematic characteristics. Assuming that Φ is a more or less smooth value in dependence on energy, the peaks observed in the reactions must be related to the peaks of the spectroscopic factors.

The calculated values of the spectroscopic factors are shown in Table 1. The same values are presented in Fig. 2 as histograms comprising the sums of the S -factor values within an energy range of 1 MeV. A comparison with experimental data of [6] shows that the theoretical study correctly represents the main peaks at energies $E = 11.8$; 15.2; 17.8, and 22 MeV. There are also moderate peaks at $E = 0$ and 3 MeV resulting from the [441] Young diagram.

Spectroscopic factors of deuterons and tritons in the ^9Be nucleus for different states of the nucleus

Levels of ^9Be		S_d^L		S_t^L		$(2J+1)\sum_L S_d^L$	$(2J+1)\sum_L S_t^L$
ΔE^* , MeV	J, T	$L=0$	$L=2$	$L=1$	$L=3$	$^7\text{Li} + d \rightarrow ^9\text{Be}^*$	$^6\text{Li} + t \rightarrow ^9\text{Be}^*$
0–2	3/2, 1/2	$3,6 \cdot 10^{-2}$	$3,7 \cdot 10^{-1}$	$9,0 \cdot 10^{-2}$	$8,2 \cdot 10^{-4}$	1,00	1,00
2–3	3, 1	$2,3 \cdot 10^{-2}$	$8,0 \cdot 10^{-1}$	$9,1 \cdot 10^{-2}$	$7,5 \cdot 10^{-2}$	2,00	1,93
4–5	3/2, 1/2	$4,3 \cdot 10^{-2}$	$3,3 \cdot 10^{-1}$	$2,8 \cdot 10^{-2}$	$2,8 \cdot 10^{-3}$	0,92	0,34
5–6	5/2, 1/2	$2,9 \cdot 10^{-3}$	$3,9 \cdot 10^{-1}$	$3,8 \cdot 10^{-3}$	$4,8 \cdot 10^{-1}$	1,44	8,04
6–7	7/2, 1/2		$2,2 \cdot 10^{-1}$		$3,3 \cdot 10^{-1}$	1,10	7,48
9–10	5, 1	$1,7 \cdot 10^{-1}$	$1,7 \cdot 10^{-1}$	$6,4 \cdot 10^{-1}$	$3,3 \cdot 10^{-2}$	0,44	4,46
10–11	5, 1	$5,0 \cdot 10^{-1}$	$3,0 \cdot 10^{-1}$	$6,2 \cdot 10^{-1}$	$1,6 \cdot 10^{-1}$	2,36	10,36
11–12	6, 1	$5,7 \cdot 10^{-1}$	$5,4 \cdot 10^{-1}$	$5,5 \cdot 10^{-1}$	$1,7 \cdot 10^{-2}$	4,50	9,48
13–14	5/2, 1/2	$6,4 \cdot 10^{-2}$	$2,6 \cdot 10^{-1}$	$6,1 \cdot 10^{-2}$	$5,4 \cdot 10^{-2}$	1,19	1,90
14–15	3/2, 1/2	$4,1 \cdot 10^{-2}$	$2,0 \cdot 10^{-1}$	$4,6 \cdot 10^{-2}$	$4,8 \cdot 10^{-2}$	0,61	1,04
15–16	5, 1	$1,0 \cdot 10^{-1}$	$1,4 \cdot 10^{-1}$	$1,8 \cdot 10^{-1}$	$2,1 \cdot 10^{-1}$	0,54	6,96
17–18	8, 2	$1,1 \cdot 10^{-1}$	$9,7 \cdot 10^{-1}$	$2,1 \cdot 10^{-1}$	$4,4 \cdot 10^{-1}$	2,96	9,34
18–19	3/2, 1/2	$3,3 \cdot 10^{-2}$	$1,9 \cdot 10^{-1}$	$1,9 \cdot 10^{-1}$	$5,9 \cdot 10^{-3}$	0,55	2,20
19–20	5/2, 1/2	$5,4 \cdot 10^{-3}$	$1,1 \cdot 10^{-1}$	$3,9 \cdot 10^{-3}$	$9,0 \cdot 10^{-2}$	0,43	1,49
21–22	13/2, 3/2	$4,1 \cdot 10^{-3}$	$2,3 \cdot 10^{-1}$	$1,3 \cdot 10^{-2}$	$1,6 \cdot 10^{-1}$	0,41	3,04
23–24	17/2, 3/2	$1,3 \cdot 10^{-3}$	$3,3 \cdot 10^{-2}$	$4,1 \cdot 10^{-3}$	$1,1 \cdot 10^{-1}$	0,13	2,12
24–25	2, 1	$2,5 \cdot 10^{-2}$	$5,5 \cdot 10^{-3}$	$3,8 \cdot 10^{-2}$	$3,3 \cdot 10^{-5}$	0,05	1,42

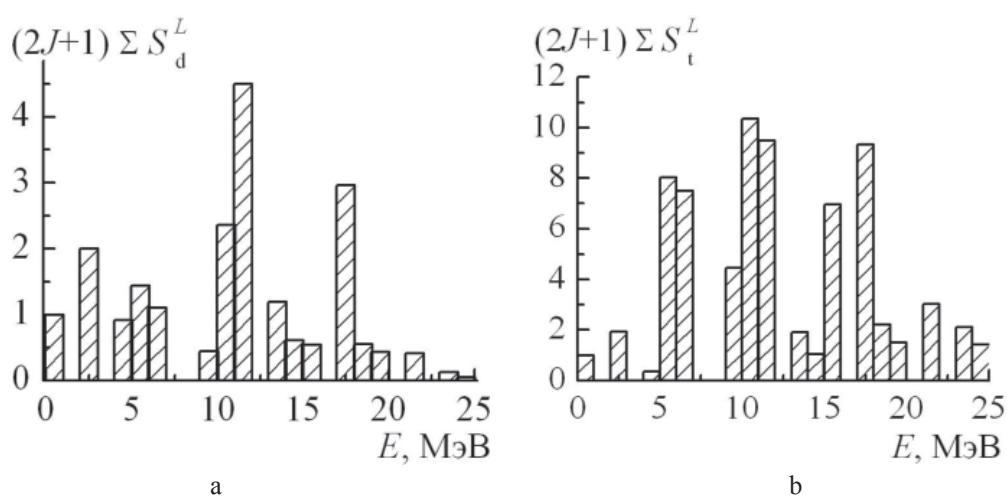


Fig. 2. Excitation spectrum of the ^9Be nucleus in reactions:
 a – $^7\text{Li}(^6\text{Li}, \alpha)^9\text{Be}$; b – $^6\text{Li}(^7\text{Li}, \alpha)^9\text{Be}$

The three-cluster states of αtd nature can be correlated not only with the orbital [432] Young diagram but also (with no less certainty) with the [441] Young diagram. It is therefore not surprising that the authors managed to provide a successful description of the (γ, d) and (γ, t) photonuclear processes in the ${}^9\text{Be}$ nucleus by using the αan -model [3].

The ground state of the ${}^9\text{Be}$ nucleus has the wave function with the dominant Young [441] diagram, corresponding to the cluster $\{\alpha an\}$ decomposition. The potential three-body model explains also the channels with escape of neutrons, protons, tritons, deuterons and α -particles. The component of the wave function with Young [432] diagram, corresponding to the cluster $\{\alpha td\}$ decomposition, is a small impurity to the wave function of the ground state. Particularly, the cluster αtd -model does not admit the observable in an experiment the escape of neutrons with forming of the ground and the first excited states of the ${}^9\text{Be}$ nucleus, whose wave functions are characterized by Young [44] diagram. The states having αtd -nature, in main are highly excited states of the ${}^9\text{Be}$ nucleus. In αtd -model it is not pos-

sible to observe an escape α -particles with forming of the ${}^9\text{Be}$ nucleus, having in the ground state the Young [41] diagram.

References

1. Boyarkina, A.N., *Struktura yader 1p-obolochki* (Structure of 1p-Shell Nuclei). – M.: Mosk. Gos. Univ, 1973. – 52 p.
2. Voronchev, V.T., et al., *Yad. Fiz.* – 1994. – Vol. 57. – p. 1964.
3. Burkova, N.A., Zhaksybekova, K.A., and Zhusupov, M.A., *Phys. Part. Nucl.* – 2005. – Vol. 36, no. 4. – P. 427.
4. Zhusupov, M.A. and Ibraeva, E.T., *Phys. Part. Nucl.* – 2000. – Vol. 31, no. 6. – P. 723.
5. Lebedev, V.M., Neudachin, V.G., and Sakharuk, A.A., *Phys. At. Nucl.* – 2000. – Vol. 63, no. 2. – P. 195.
6. Glukhov, Yu.A., et al., *Yad. Fiz.* – 1971. – Vol. 13. – P. 277.

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*Materials of Conferences***SOCIAL AND PSYCHOLOGICAL
ADAPTATION OF FOREIGN STUDENTS
AS A ACQUISITION DETERMINANT
OF RUSSIAN CULTURAL FIELD**

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Educational problem of foreign students in universities of the Russian Federation is becoming more important due to the establishment of new requirements for effectiveness of higher education institutions. And while the major cities of the European part of our country have a considerable experience, Chelyabinsk, the city that has been closed for foreign citizens for a long time, has been just gathering such kind of experience. Geography of the countries, from which foreign students come to Chelyabinsk is wide enough, which means that the students display and try to realize well-various cultural traditions and needs here as well. The policy of our university is aimed to the assurance of a favorable social and psychological adaptation of foreign students, taking into account not only their culture, but also their individual and psychological personality characteristics, their value and reason-for-being orientations.

At the present time, the educational system of the Russian Federation (in particular the higher education system) is actively integrating into the world educational space: there are a large amount of bilateral international diploma mutual recognition agreements signed by the government of the Russian Federation and a wide range of the CIS, European, Asian, African, Near Eastern and Latin American countries. In 2003, Russia joined the Bologna process (following 46 European countries), which aim is the formation of common education space in Europe, the maximal contingency of national education systems and training of specialists in accordance with the demands of the European labor market.

Education of foreign students in Russian universities is one of the competitiveness indexes of the Russian higher education system. The number of foreign students coming to Russia in order to get the higher education is increasing year by year. As a result, the necessity of investigation of the foreign students' adaptation phenomenon is conditioned by its scientific and applied importance.

Adaptation process has a complex structure and represents interaction of different kinds of adaptation (psychological, socio-psychological, biological, cultural, physiological, etc.), which is allied to the overcoming of cultural and language barrier by a migrant surrounded by the defined ethnos.

Adaptation process supposes the fact of psychological mobilization oriented to the overcoming of difficulties and the formation of internal equilibrium.

Social adaptation is analyzed in academic literature as a process of an individuum entering into the new sphere of social, group, interpersonal relationships and the adjustment to the new social environment. (J. Piaget, S.D. Artemov, I.A. Miloslavova). Social adaptation phenomenon includes socialization process, i.e. an acquirement of base apparatus of social code and values allowing an individuum to act as an independent subject in the society.

Defining the adaptation as a process, it is necessary to mark such personality characteristic as its adaptability, i.e. that kind of personality-environment interaction condition whereby a personality carries out its main activity successfully and satisfy its own social needs, without long-term inner and outer conflicts.

Deviation in adaptation processes leads to the socialization process abnormality, which is evident as a feeling of instability, frequent conflicts between personality and foreign-language social environment.

In order to accelerate the socialization of foreign students under the new conditions, more extensive investigation of their personalities, value and reason-for-being orientations and provision them with psychological and pedagogical maintenance are possible. Foreign students, who for the first time found themselves in a new cultural environment, are often in mental dissonance and live a sort of double life: alone with themselves within a native culture, but they try to adjust the new culture in company.

This caused by both a half knowledge of language of the new socio-cultural environment and the failure to define different social roles which are taken by participants of a situation, the lack of implied sense knowing, understandable for native speakers [1].

In the numerous studies of foreign and national scientists several types of external and internal factors influencing degree and duration of adaptation are distinguished. Personalities of individual refer to the internal factors. First of all it is age of a person (the younger person is, the easier an adaptation takes place); secondly, the level of education (it is proved that well-educated people who can speak one or more languages adapt a foreign culture without big problems) Positive self-esteem, sociability, professional competence, readiness to adopt and respect code and traditions of a new culture, openness to changes, mobility also refer to personality characteristics making easier the adaptation process. Social status of individuum, experience of stay in foreign cultural environment and contacts with bearers of other cultures also have a positive impact on the adaptation.

Culture of any country, by definition of D. Mazumoto, includes a system of rules covering mind-sets, values, opinions, images, code and behavior which are relatively stable in time and generations.

Individualism-collectivism (IC) has become the most noted index of cultural diversity in the cross-cultural studies. Anthropologists, sociologists and psychologists use this index equally for an explanation of differences between cultures. Representatives of individualistic cultures (The USA, The Great Britain, Denmark, Finland, etc) consider themselves independent and autonomous individuals whereas representatives of collectivist ones (China, Korea, Pakistan, Colombia, Venezuela) recognize themselves tightly bound with other people. In the individualistic cultures the personal needs and goals exceed the needs of other people; in a collectivist culture the personal needs are sacrificed for the group interests [2].

Since the interaction culture peculiarities (demographic, economic, political, socio-cultural) refer to external adaptation factors, it can be supposed with the high likelihood ratio that the more common things both in the culture of a migrant native country and the new culture are, the easier one adjusts the foreign culture space [3].

It should also be taken into account the following factors which have an impact on education systems of countries from which students come to Russia: geographical, economic, national, cultural and religious which are unique for each particular nation. Each ethnos has its own methods and approaches applying in pedagogical process and which should be taken into account in the educational process of foreign students.

Having come to Russia, foreign students change their socio-cultural environment. The accustomed communicative relations with family, fellow citizens and friends are disrupted. Process of adaptation to the new conditions of external and internal environment starts. Foreign students are emotional over failed exams and unsatisfactory marks more painful than their Russian classmates. The last point is conditioned by the feeling of heavy responsibility towards a family, government, university tutors, and immigration officials. Active cultural and social life, intercourses definitely help to overcome a lot of difficulties of entering into the new culture.

Not all of the foreign students have interest in an alien country. They contrast their own culture with what they see in Russia. Much of Russian reality shocks them and causes a misunderstanding. Foreigners respect a new culture, but keep their traditions, manners and habits alive. Differences between native and alien lifestyles surprise the one student and gladden the other. The most of difficulties appears for students who are indifferent to native and alien cultures. As a matter of fact such kind of passive and indifferent students is in the minority. Basically those are who came to Russia, «because of parents or government decision».

Under those conditions, the optimal algorithm for «entering» a foreign student into educational process is the integration taking place in the process of active acquisition of the other national culture and keeping their own national identity. Exactly the integration into the new cultural environment becomes the main index of successful adaptation [4].

As practice has shown, carrying out any public event with the participation of foreign students positively affects their integration and adaptation. That's why the importance of such carried out events as the First Pan-Russian Festival of Foreign Students and First Festival of Scientific and Creative Achievements of Foreign Students in Tomsk in 2007–2008, in which the students from 51 countries took part, can hardly be overestimated.

The national science study results on this question and historical experience available in Russia from the time of the first youth and student festivals, clearly demonstrate that the introduction of foreign students to the Russian culture by group travels, celebration of traditional national holidays, etc. also are the efficient controller of adaptation, integration and overcoming the aloofness barriers [5]. Social and psychological adaptation of foreign students definitely is the key acquisition determinant of Russian cultural field and the factor of favorable and efficient education.

References

1. Educational migrant character study. Basic aspects of academic, linguistic and socio-cultural adaptation: multi-author book / science editor E.Y. Kosheleva. – Tomsk: «Raus MBH», 2011. – 204 p.
2. Mazumoto D. Psychology and culture. – 1st edition. – SPb.: Peter, 2003. – 718 p.
3. Ann-Wilson L.F. Social and psychological peculiarities of cross-cultural adaptation of Russian students in Germany: author abstract of psychological sciences candidate, speciality 19.00.05. – Kazan, 2003. – 17 p.
4. Rementsov A.N., Kazantseva A.A. Socio-cultural aspects of foreign students adaptation // Alma Mater (High School Messenger) State Technical University–MADI (STU-MADI). – 2011. – № 7. – P. 10–14.
5. Poletaev D.V. Russian Universities as a mechanism of adaptation of educational migrants: monography «Transborder migrations and host society: mechanisms and practices of mutual adaptation». – Yekaterinburg, 2009.

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SOCIALIZATION OF A TEENAGER'S PERSONALITY IN INTERACTIVE LEARNING

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The modern stage of the general education system development is characterized by much attention to the problem of development of the teenager's

personality in his individuality, originality, uniqueness, peculiarity that is related to the expansion of the information space, emergence of new forms and means of communication and increased need to find new, effective mechanisms of person socialization and education.

A high rate of modern society development, changes in all spheres of human life require a new qualities set of a person such as an ability of easy adaptation to the changing conditions of the environment, a high social mobility based on lifelong education and ability to learn, readiness and ability of self-development, independent actions and activities, taking responsibility for their results, ability to overcome difficulties, development of self-image, positive self-evaluation and life view.

Enrichment of the teenager's social experience, formation of his personality, including all necessary qualities and skills occur most effectively in the process of human communication that becomes a key activity in adolescence period as in Russian pedagogy and psychology this time is considered a very favorable and sensitive for communicative competence development.

Due to Feldstein D.I., socialization and communication development, increased teenager's demand of self-presentation today are blocked by a lack of appropriate structures corresponding to his needs and abilities. Thus showing disorder, increased anxiety, hostility towards adults, entering new informal groups, looking for a friend over the Internet are the result of teenager's growing problem.

According to philosophical, psychological and pedagogical literature under study, group interpersonal interaction of educational activity's subjects organized to solve a problem situation of communication is the basis of interactive learning. It has a personality-developing and socializing potential (Brodsky U.S., Dobrynina T.N., Geikhman L.K., Kargapol'tseva N.A., Kashlev S.S., Matvienko T.I., Nazarov N.V., Panina T.S., Panphilova A.P., Peskova L.A., Rydensky E.V., Savinova I.A.).

The interactive learning of teenagers at the foreign language lessons includes all types of general academic actions (social, personal, cognitive, communicative) marked by the general education program, because the purpose of a foreign language learning in primary school is the development of foreign language communicative competence and development of teenagers' personality through the usage of the foreign language educational potential.

The main point of the socialization that is in the centre of our research determined by its stages such as adaptation, individualization and integration. The notion «personality» includes only social properties and qualities of a person produced during his life, characterizes person's social entity. All aspects of personality are found only in activities, interaction and relations with other people.

During adolescence a person presses towards self-knowledge and personality expression that is

the result of individualization or personalization. A teen continues to be a pupil but his attitude to educational activity changes, psychologically education becomes not of some importance. Elkonin D.B. believed the leading activity in adolescence is a communication with teens of the same age when there is a playing of human relations most diverse aspects, relationships building, realization of deep mutual understanding desire and getting norms and values into the habit. Vygotsky L.S. considered the problem of interests to be a «key to the whole problem of psychological development of a teenager».

In this context we understand the phenomenon of socialization of a teenager's personality in interactive learning as the process of getting norms, values, ways of thinking, behavior rules, forms and means of social communication into the habit by a teenager as a result of active interpersonal verbal and nonverbal activities, cooperation in educational groups and groups with each other to solve problems on the basis of personal life experience of each subject of the educational process.

The following pedagogical conditions of socialization of a teenager's personality in interactive learning are defined in our research work:

- realization of the teenagers' educational networking in interactive learning;
- actualization of interactive potential of the educational subjects' relations;
- tutorial support of a teenager's cognitive activity.

A realization of these conditions allowed to make a conclusion that socialization of a teenager's personality in interactive learning is a goal-directed, gradual and effective process.

During the experimental work some peculiarities of the socialization of a teenager's personality in interactive learning were defined. They are: the interpersonal dialogical interaction of educational process subjects in system «Teacher ↔ teenager» and «teenager ↔ teenager»; learning in small groups in emotionally favorable atmosphere on the basis of cooperation; active role-playing and situational forms of educational interaction; audience feedback, analysis of success and failure reasons in group activities; topic of the lesson's chose taking into account age, preferences, abilities and educational interests of teenagers.

In this aspect we defined the criteria (cognitive, emotionally-valuable, communicative-active), indicators (social competence, independence, verbal and nonverbal activity) and levels (beginner, intermediate, upper intermediate, high) of socialization as a continuous, persistent process of development and self-development of the teenager's personality in the conditions of interactive learning.

For diagnostic data we used the following methods of research: teenagers' questionnaire to identify the significance of the educational networking for their development; procedure «Value orientations» by Milton Rokich; questionnaire «Feedback»; diag-

nostics of person's interactive orientation by Shurkova N.E., Fetiskin N.P.; procedure of personal development's studying by Rozhkov M.I.

In the course of the study we have identified the following structural components of a teenager's personality: *cognitive* (reflects different directions of teenager's knowledge, e.g. self-knowledge, knowledge of social norms and relations); *emotionally-valuable* (regulation of teenager's behavior due to social norms; assessment of own and group activities; understanding of activities' social value, of self-worth and self-acceptance); *communicative-active* (including communicative (verbal) and educational activity, personality expression, development of educational interests, creativity, skills of self-education for the successful self-realization in the future).

Thus, the existing experience of socialization of a teenager's personality in interactive learning was summed up in the process of research work through the realization of the teenagers' educational

networking in interactive learning, actualization of interactive potential of the educational subjects' relations and tutorial support of a teenager's cognitive activity. This research work made it possible to make a conclusion that this complex of pedagogical conditions is necessary and sufficient for the successful socialization of a teenager's personality in interactive learning.

All above proves that the aim of research work is reached and the problem is solved.

We do not claim the final decision of this issue and believe the next research may be devoted to the problem of socialization of a student's personality in interactive learning; to the studying of the environment role in forming the teenagers' experience of interactive cooperation.

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