

The Strategies  
of Modern Science  
Development

VII International  
scientific–practical conference

**14-15 October 2014**

Proceedings

CreateSpace  
North Charleston, SC, USA  
2014

**Scientific Publishing Center "Discovery"**  
**otkritieinfo.ru**

The Strategies of Modern Science Development: Proceedings of the VII International scientific–practical conference. North Charleston, USA, 14-15 October 2014. - North Charleston: CreateSpace, 2014. - 126 p.

The materials of the conference have presented the results of the latest research in various fields of science. The collection is of interest to researchers, graduate students, doctoral candidates, teachers, students - for anyone interested in the latest trends of the world of science.

**ISBN: 978-1503363830**

O Authors, 2014  
O Scientific Publishing  
Center "Discovery", 2014

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## SECTION I. Mathematics

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### **THAT IS WHY I DO NOT ATTEND TO THE LECTURES ON THE THEORY OF PROBABILITY**

Everyone knows that at the first lecture on the theory of probability you will be shown such a chart.

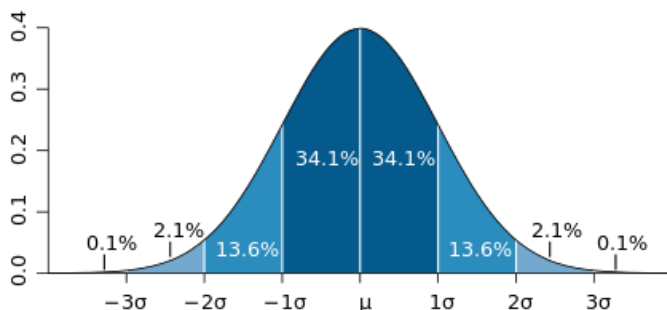


Figure 1. The graph of the probability density of the normal distribution

Further, the explanation that it is a graph of the probability density of the normal distribution follows - one of the most important functions of the theory of probability, where the expectation  $\mu = 0$  and standard deviation  $\sigma = 1$ . I would even specify that you will only use it during the entire course of study. Normal distribution (it is also a Gaussian distribution) – is a very useful thing. The law is the most common in practice the law of probability distribution, it obeys the same amount of a sufficiently large number of independent random variables.

In higher mathematics textbook for lawyers (and any other sources), we read: "If the random variable  $X$  is the sum of a very large number of mutually independent random variables, each of which impact on the entire amount is negligible, then  $X$  has a

distribution close to normal "[1]. It would not be easy to find dozens of examples of sets of obeying this law itself.

It would seem that our hands were given a unique tool that is applicable to almost everything. It would be so, if Gaussian distribution was applicable to life.

Firstly, in the academic literature we read just (or tell us about it on professor lectures) that "the more accurate approximation is performed, the greater the number of random variables summed." According to the law of large numbers combined effect of a large number of identical and independent random factors leads to a result in the limit does not depend on chance. Now we transfer it to a reality. The case is the case and will determine everything! Fully mistakenly believe that everything can fit under some very nice template (initially with certain assumptions).

Let us refer to the history. Monday, October 19, 1987 is known as the day that was the biggest drop Dow Jones Industrial Average in its history. If the world of finance obeys Gaussian distribution, then: a) the stock market crash on the planet Earth would not matter; b) such an episode would occur no more frequently than once every few billion of the universe. [2] But: a) collapse was of great importance for the economy of the world (such as the stock exchanges in Australia lost to the end of October, 41.8%, Canada - 22.5%, Hong Kong - 45.8% UK - 26.4%, the Dow index Jones); b) A little more than 20 years and began in 2008 global crisis (global recession). It is worth noting that there were no visible events preceding the 1987 crisis.

Again an accident! The accident is crucial! One of the least understood aspects of the Gaussian curve is its weakness and vulnerability assessment "extreme" events. The chances of rejection at 4sigma are twice higher than 4.15 sigma. Chances of rejection at 20 Sigma - a trillion times higher than 21sigma! It means that a small error in the measurement of sigma will lead to a huge underestimation of the probability of certain events with respect and we can make a mistake in a trillion times [2]. It is those events that, let's say, not very probable according to the normal distribution, carry a key meaning.



Over the past 15 years, the world has experienced a number of events, in principle, impossible according to already love us the theory of probability: September 11, 2001, I have already mentioned the global crisis, the armed conflict in South Ossetia, the terrorist attack in Beslan, and more, the latest are the events in Ukraine. All of these are the "tail" events of Gaussian curve.

There is a more specific example. The area of my professional activities is related to the planning of the budget of the enterprise. Actually, the word "planning" with the current conditions sounds weird. In general, everything went quite well, if only a "but" that at the beginning of the year (and the budget I planned at the beginning of the year) neither I nor anyone else could predict: the attachment of the Crimea to Russia. Omitting the details of the impact of this event on my work, I would say that these political and economic events adversely affected the livelihoods of the company where I work, and as a result my income plan can be implemented only by 75-85%. With more than a billion dollar turnover, this loss is powerful. And such examples are the n-th set.

Gauss distribution is a very good tool in the theory of probability. It is great to solve the puzzles from the textbook, but is not suitable to appeal to them in the real economy in particular and life in general. And, since I believe that higher education is designed to teach thinking and not using the templates to lectures on the theory of probability, I do not attend to them anymore.

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## **SECTION II. Information Technology**

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### **STRUCTURAL ANALYSIS OF THE SYSTEM OF COMPLEX OF INFORMATION FLOWS WITHIN THE MEDICAL DIAGNOSTIC INSTITUTION**

At the present time it becomes the need to increase the level of automation and informatization of medical diagnostic institutions. Modern medical institutions store huge amounts of data, and the level and quality of service depend on how fast this data will be processed.

**Research actual** is conditioned by the need of information flows automation in medical institutions with the view of quality of service improvement.

**The research purpose** is a structural analysis of complex of information flows within the scope of medical diagnostic institution.

The structural analysis examines troubles of organization of common information center, ensured communications between units of institution, also external bodies and institution.

The structural analysis is one of the approaches to complex systems design of different purposes [1]. Structure of the system must have components operational in semiautomatic and automatic modes, also linking them external interface components. Components operational in semiautomatic mode are presented by the following workstations:

- workstation of registry;
- workstation of laboratory;
- workstation of management;
- workstation of auxiliary units.

An automatic device (line) works at semiautomatic mode.  
Following elements working at automatic mode:

- database;
- a module of external exchange;
- a module of main reporting;
- a module of auxiliary reporting.

The first phase of medical research is a registration order in the system. This action can have two resources: external (communications with other medical institutions) and internal (at the level of institution). The initialization of order on the internal resources is begun with the workstation of registry, a computer with special software, which has the main function to enter in database patient cards with study task. Registrars perform this action centrally or in units. The patient registration on the external resources is executed on the secure channels by the use of module of external exchange. This module is presented by the common batch program, in which contains database of external medical institutions. At the level of this module, all participants are able to:

- have and to accumulate its own database within the tasks;
- exchange information with other participants, including in the form of the single queries;
- transfer all or part of the stored information to other participants of information exchange [3].

The phase of orders registration is fundamental and requires exact entering all the parameters of the order: the personal data of patients, the order parameters, the customer parameters. It affects the economic and organizational structure of the system. At the stage of orders registration should be taken all possible ways to simplify it, and should be provided maximum ease of service of regular customers by the use of modern information and computer technologies.

All information about the system operation goes into a database (DB), provided by the server. The server allows you to perform the functions of:

- storage and processing data, ensuring their integrity;
- integration all modules of the system;
- distribution of data between different units of the company.

After entering the information on the server, all data are become the common for all units of the institution, the data access mode becomes interactive. To ensure the operability of information exchange with the database, it is necessary to ensure a high level of computer literacy of staff. At the stage of database creating it is required to ensure seclusion and self-sufficiency of each of the stages of the system implementation, so the initial phase of the introduction of systems of this class is one the most time-consuming and costly with a financial and time viewpoint. A compulsory phase is an accurate marking of materials with using by technologies suitable for automatic reading. This marking is common for all units.

An automatic diagnostic device or a line generates a database query to receive the research task of the technology "worksheet", and after task execution results are sent back to the database. After that it is done the checking of the results and the comparison them with standard specifications, it is generated the resolution. The results with the resolution are sent to the workstation lab, where a specialist confirms the resolutions and generates results on letter-head output. The return of research can be done in several ways:

1. Physical return of the certified results. This method is traditional.
2. Return of the results in electronic form. This method is an alternative and handier for customers that it increases their loyalty.
3. Transfer the research results by the use of a module of external information exchange. This method provides a high level of automation of information exchange.

Thus, it is realized the module work of main reporting. Besides the basic manufacturing operations the medical system includes an auxiliary module that performs the following functions: organizational, resource, human, economic, legal, informational, technical, economic, etc. It, like the module of main reporting, is represented special program packages, which generate reports of indicators of units work. These reports are accumulated in workstation of management. ARM of management carries out the function of system operation control.

In fact, auxiliary operations are performed by respectively parts of the enterprise which are fully involved in the common information process by the use workstations.

The result of the system work is the forming of a complex reporting on the main and auxiliary parameters of production, which is carried out in a software environment performed in the automatic mode. Also reporting on the key performance indicators includes a number of additional services such as: information consultancy, automated generation of proposals for the development of the list of provided services. In this case, operation of the system is based on access to the database in order to receive and to fill in forms for all kinds of work institutions. The form is created by the operator or the automated manner. Availability database allows transferring data the auxiliary character between units, which reduces the number of the same type of routine work for the staff.

The link between the devices of the system is carried out by the use of external interfaces.

External interface – a hardware and software complex as part of the adapted protocol of data transfer. It is individual for each recipient of transceiver data, and a secure communication channel required for data protection.

The essence of the approach to automation is to create a common information center capable of receiving and processing information about the activities of health facilities by the use methods:

- mass development of information and communication technologies and related hardware;
- creation of workstations;
- creation of a bank of computer programs, for medical purpose, and for business management (an administrative and management task);
- creation of databases;
- active introduction of new information technologies in the medical process.

The structural analysis of the complex of information flows within diagnostic medical institution enables to reveal the system

structure and the relationship between its components. It makes the system scalable from one side and there tenability individual parameters of the process for each of the units on the other side.

Thus, the structural analysis promotes to the creation of conceptual medical information system, the implementation of which will allow transferring the company to the new technological and organizational levels, and making it more competitive in the current economic environment.

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## **GENERALIZED ALGORITHM OF DECISION IN THE DEVELOPMENT OF EDUCATIONAL DISTANCE EDUCATIONAL PROGRAMMES**

In the conditions of transition to the information, post-industrial society the ability of graduates not only to have the knowledge and information, but also to successfully be applied to act against the background of the experience, to extract new knowledge from the general flow of information on the background of constantly changing technology, is of special importance. It is enough for modern graduates to have simple possession assimilated during training information, they should be able to apply their knowledge and if they lack to fill the gaps. In accordance with the challenges of the modern world federal state educational standards of higher professional education (HPE GEF) ask for a list of graduates of professional competencies. In the process of training the emphasis should be shifted from the teacher and the curriculum at the student and the expected results of education, i. e. on the formation of students' professional competencies. In these circumstances, it is necessary to create and test the new models of student learning including distance education programs, which entails the need to change the existing approaches to the development of educational programs.

With the development of educational programs (OP) one of the traditional methods is to copy an existing list of disciplines, students read for decades, with little change at the level of the names of disciplines in order to meet the requirements of the formal GEF VPO. This approach is appropriate in terms of

teachers, so it does not require them to develop large amounts of new teaching materials, a fundamental change in the existing work programs and teaching materials (CMD), but it cannot be used in the development of modern OP within the existing educational standards. The modern OP are competence-oriented, so the main goal in their design should be the formation of a student competencies needed him in a modern society in the performance of professional activities.

Decision-making processes, which can be applied in the development of competence-oriented OP are described in the literature [1,2]. On the basis of the analysis of structures of decision-making in various fields of science as applied to the design process of distance OP designed the structure is shown in the figure.

The initial stage of the development of OP is associated with the formulation of the problem, i. e. the difference between what the students should be able to demonstrate after the development of the OP, and the fact that they show really. It is first necessary to rely on the opinions and reviews of consumers of educational services, which serve students themselves, their parents, employers and the state. The denser will work with them at this stage, the less correction is required in the future OP and the greater will be the degree of customer satisfaction.

The data which are necessary for formulating problems include:

- Information from the GEF VPO (the composition of competencies of basic disciplines, exemplary curricula);
- The requirements and wishes of consumers, the situation on the labor market, information about the employment of graduates and their career development, professional issues, etc. ;
- Information about ongoing educational programs in high school (part of the disciplines, the degree of availability of material resources, information about the faculty members, the immediate wishes of teachers, etc.);
- Information on similar educational programs in other universities (in terms of transfer of educational technology);



- Information about the content of the disciplines (work programs, the content of the CMD, the lecture course, practical work, and others.).

The next stage of development is the formulation of objectives OP, i. e. the answer about what should be done to relieve the problem. It is necessary to proceed from the available resources: human, logistical and financial.

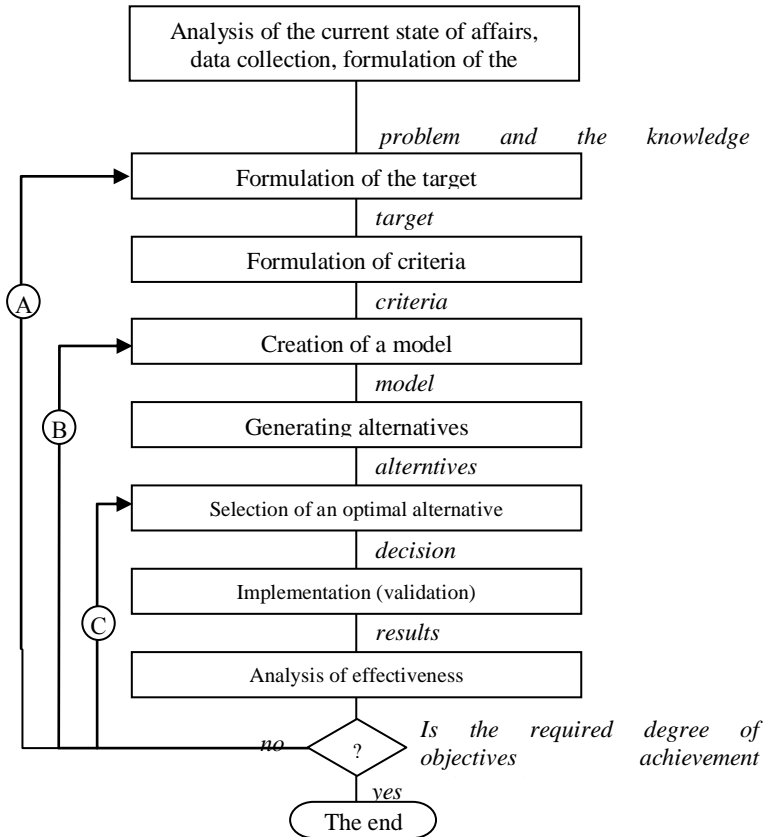


Figure 1. Algorithm for decision making in the development of educational programs

In higher education while working with consumers of educational services multiple targets usually take place. Then, this

purpose may be in conflict with each other. In this case, among the many purposes it is necessary to try to find or create a global goal. If this cannot be done, it should rank the goals in order of preference. The research objectives should include the possibility of refinement, expansion or even replacement. This fact is the main cause of iterative procedures Systems Analysis (iteration "A" in Figure 1).

The formulated objective (s) defines a set of criteria by which to assess the degree of achievement of the purpose (s). The criterion is a mapping of values embodied in the purposes for alternatives options that allow ordering. Thus a significant limitation on the quantity and quality criteria is that the choices of a large number of quality criteria, that are significantly different, complicate the analysis of the impact of the OP.

After formulating the problem, the objectives and criteria on the basis of previously obtained data and knowledge base, build a model of the educational process, which is represented as a set of sub models of different types, which include [3]:

- Linguistic models - for example, verbal descriptions of processes;

- Production models as the most general formalism for knowledge representation (usually represented as a set of rules such as "if ... then ...");

- Logical models presented in the form of provisions of predicate logic, fuzzy logic, multi-valued logic, the logic of fuzzy sets;

- Semantic networks - are a set of interrelated concepts that allows you to display a visual form of logical and genetic relationships between the elements of the structure of the educational material, showing the causal relationships between the elements of the program, etc .;

- Frame-based network constructed from homogeneous structures and containing the search procedure and optimize the information elements.

Based on the obtained data and knowledge base decorated in the form of a model of the educational process, an alternative to the OP options is formed, each of which corresponds to the goal.

Generating alternatives – is the creative process. There are the ways to generate:

- Involvement of experts with different backgrounds and experience;
- Interviews with stakeholders and the broader questionnaires;
- Increase the number of alternatives due to their combination of intermediate options between previously proposed;
- Modification of the available alternatives, i. e. formation alternatives only partially differs from the known.

The special importance of the next stage selecting the best alternative, is the need for informed the choice of the best OP.

OP adopted for optimal at this stage is being tested (see. Step "Implementation"), after which the determination is carried out to target achievement. If the desired degree of achievement of the objectives is achieved, the process of developing the OP can be considered complete. But, as a rule, we have to make a number of iterations before it happens.

The task of developing and selecting the best alternative that is simply formulated is often difficult to solve because the method of its solution is determined by the type and dimension of the set of alternatives, as well as selected criteria that may qualitatively differ from each other. The result has to hold a number of iterations for choosing the best alternative (iteration "C" in Figure 1).

It should be noted that in the process of working on an educational program of testing and analysis of the impact may change the state of a problem situation, personal and quantitative composition of the participants, the relationships between the parties concerned, etc., which affect the process of generating alternatives and selecting the optimum. In this case, it is necessary to correct the model of the educational process (iteration of "B" in Figure 1).

### **The findings**

It can be seen, that the process of the development of educational programs including distance education is iterative, comprising at least three loop iterative cycles. The stages of the study of the educational process and the implementation of new programs actually merge. Ongoing studies have an impact on the

livelihoods of the system, and it alters the problematic situation posing a new challenge studies. The new problem situation encourages the continuation of the system analysis, etc. Thus, the problem is being gradually solved in the active research.

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### **SECTION III. Chemical sciences**

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#### **FEATURES OF PHYSICAL AND CHEMICAL PROPERTIES OF A SURFACE OF ADSORBENTS OF SYSTEM CDS–CDTE**

In work acid-base, adsorption and catalytic properties of semiconductor adsorbents of system are studied CdS–CdTe – binary (CdS, CdTe) and multicomponent ((CdS)<sub>x</sub>(CdTe)<sub>1-x</sub>). The interrelation between the studied properties which opens opportunity not only to predict, but also to estimate the adsorption and catalytic properties on the basis of less laborious researches of acid-base properties is found.

Objects of researches represented powders and nanodimensional films CdS, CdTe and their solid solutions  $(\text{CdS})_x(\text{CdTe})_{1-x}$  ( $x = 0.16; 0.24; 0.5; 0.61$ ). Techniques of receiving powders and films of solid solutions, films of binary connections are described in [1,2].

Acid-base properties of a surface studied methods of hydrolytic adsorption (definitions pH isoelectric condition of a surface –  $\text{pH}_{\text{iso}}$ ), mechanochemistries, nonaqueous conductometric titration, IR spectroscopy the multiple frustrated total internal reflection (FTIR IR) [1,2].

Adsorption was studied by means of piezoquartz microweighing (limiting sensitivity,  $1.23 \times 10^{-11} \text{ g}/(\text{cm}^2 \text{ Hz})$ ), measuring electroconductivity and FTIR IR in the temperature range of 250 to 473 K and pressures of 2 to 14 Pa.

Our adsorbates ( $\text{CO}$ ,  $\text{NO}_2$ ,  $\text{NH}_3$ ) were prepared following the familiar procedure in [7].

Catalytic researches carried out bezgradiyenty by a flowing method [7] in the conditions excluding influence of processes masso- and heat transfers:  $T=298 - 473 \text{ K}$ ,  $P = 101308 \text{ Pa}$ , rate of volume flow of gas – the carrier (air) 22–24 ml/min, impulse volume 5 ml.

*The executed researches of acid-base properties* of a surface of semiconductors of system CdS–CdTe allowed to define the nature, force, concentration of the acid centers, nature of change of force and concentration of the acid centers at change of structure and influence of gases adsorbates. The following most important facts attract attention.

Values  $\text{pH}_{\text{iso}}$  initial (exhibited on air) surfaces answer subacidic area and with change of structure accrue in sequence:  $\text{CdTe} \rightarrow (\text{CdS})_{0.16}(\text{CdTe})_{0.84} \rightarrow (\text{CdS})_{0.24}(\text{CdTe})_{0.76} \rightarrow (\text{CdS})_{0.5}(\text{CdTe})_{0.5} \rightarrow (\text{CdS})_{0.61}(\text{CdTe})_{0.39} \rightarrow \text{CdS}$  (от 5.9 до 6.5). Such regularity follow-up confirms education in system CdS–CdTe of solid solutions of replacement also testifies to influence of physical and chemical properties of binary and element components as on volume, and the surface, and on the surface characteristics of solid solutions.

Natures of change  $\text{pH}_{\text{iso}}$  at ammonia influences (a surface alkalizing) and white damp (an alkalizing at surplus CdTe and

acidifying at surplus CdS) will be coordinated with mechanisms of their adsorption interaction (it will be a question below).

*At a dispersion of semiconductors of system CdS–CdTe in water it is noted, depending on structure, and acidifying (at  $X_{\text{CdS}} \geq 0.5$ ), environment and alkalizing (at  $X_{\text{CdS}} \leq 0.5$ ) with prevailing change pH at a dispersion of CdS and solid solutions with its surplus.*

*Existence on differential curves of a nonaqueous conductometric titration of all studied semiconductors exhibited on air, three peaks [5] testifies to existence on a surface of various types of the acid centers differing on force. Responsible for them, most likely, coordination and unsaturated atoms (Lewis's centers), the adsorbed molecules of water and  $\text{OH}^-$  group (Brensted's centers) [1,2], on what act, in particular, specify also IR spectrums [5].*

*Extreme nature of dependence of the common concentration of the acid centers (calculated on the first, second and third peaks) on structure of system (with a maximum at  $X_{\text{CdS}}=0.16$ ) points to possession by solid solution  $(\text{CdS})_{0.16}(\text{CdTe})_{0.84}$  the greatest concentration of the acid centers  $\text{B}$  ( $4.6 \cdot 10^{-3}$  g-equiv/g), and noticeable decrease that at exposure in the atmosphere CO – and on its greatest adsorption activity.*

*From the analysis of the main experienced dependences of adsorption  $\alpha_p = f(T)$ ,  $\alpha_T = f(p)$ ,  $\alpha_T = f(t)$  (see, for example, fig. 1), results of calculations of heat ( $q_a$ ), adsorption activation energies ( $E_a$ ), researches of acid-base properties of a surface of adsorbents follows: at temperatures below 303 K ( $\text{NH}_3$ ), 323 K (CO) physical adsorption proceeds, at more high temperatures – chemical activated.*

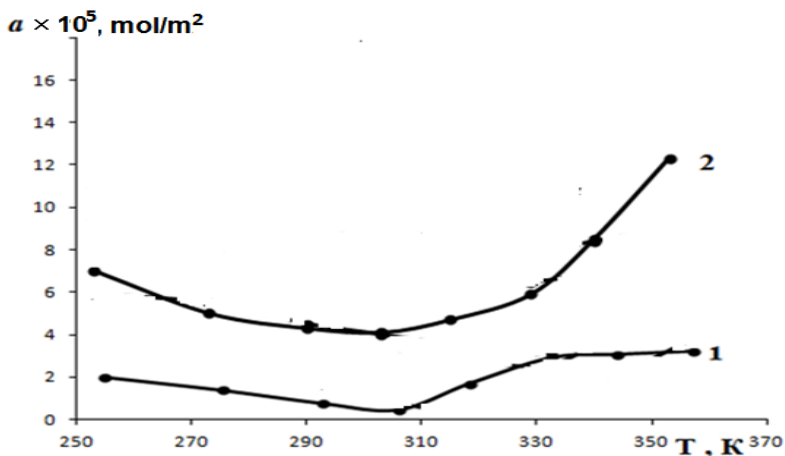


Fig. 1 Adsorption isobars CO (1) and NH<sub>3</sub> (2) on CdTe at P = 13 Pa.

As a result on the basis of dependences "the acid-base characteristic structure" was succeeded to predict, and on the basis of dependences "the adsorption characteristic – structure" to find the most fissile adsorbents of CdS-CdTe system in relation to CO ((CdS)<sub>0.16</sub>(CdTe)<sub>0.84</sub>) and NH<sub>3</sub> ((CdS)<sub>0.24</sub>(CdTe)<sub>0.76</sub>) which served as materials for creation of sensors on microimpurity CO и NH<sub>3</sub>. Besides, the conclusion about expediency of use of the corresponding adsorbents of CdS-CdTe system as catalysts is made and, first of all, than neutralization catalysts in reactions with participation of the called adsorbates is more narrow at an investigation phase of acid-base properties [1,2]. It is confirmed with direct catalytic researches on the example of reaction of restitution by NO<sub>2</sub> ammonia [5].

*The main results of direct catalytic researches, in particular, on CdTe are presented in tab. 1.*

Table 1

Catalytic restitution  $\text{NO}_2$  ammonia on CdTe at structure  
of an original stock  $\text{NO}_2 : \text{NH}_3 = 1:2$

$m_2$	$\chi, \%$	$m_2$	$\chi, \%$
$m_1 = 16.49 \text{ mkg}$		$m_1 = 24.47 \text{ mkg}$	
8.51	48.39	5.85	76.08
4.26	74.19	4.79	80.43
4.04	75.48	4.79	80.43

*Designations:  $m_1$  and  $m_2$  – the maintenance of  $\text{NO}_2$  on an entrance to the reactor and on escaping it,  $\chi$  – extent of transformation of  $\text{NO}_2$*

***By comparison of behavior of semiconductors of system CdS-CdTe as adsorbents in relation to gas-reagent ( $\text{NH}_3$ ) and as the catalyst in relation to reaction with its participation – reactions of the selection restitution by  $\text{NO}_2$  ammonia – the particular interrelation between the adsorption and catalytic properties attracts attention. Namely we note: coincidence of temperature areas of course of chemical adsorption (individual and collateral) and catalytic reaction; temperatures of the beginning of chemical adsorption and catalytic reaction (290-298 K); temperatures of the greatest chemical adsorption and greatest catalytic transformation; mechanisms of collateral chemical adsorption of reagents and their catalytic transformation.***

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## **SECTION IV. Biological sciences**

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### **MODERN TECHNOLOGIES IN GENE THERAPY**

Genetic modification, often referred to as gene therapy, is a procedure whereby the genetic content (DNA sequence) of a cell, many cells or a whole organism is modified. Most often, non-functional or malfunctioning genes are replaced, manipulated or supplemented with healthy genes. In humans, there are two categories of genetic modification: somatic and germline. Somatic gene therapy consists of introducing a gene or gene segment into specific tissues or organs (excluding germline cells or reproductive cells) in a human subject with the aim of treating or curing an existing condition. Unlike germline genetic modification, somatic gene therapy does not alter the genetic make-up of future generations because the altered gene does not exist in reproductive eggs or sperm. Germline gene therapy, on the other hand, is a more controversial technique because the introduction of a gene into germline cells will result in heritable changes that affect future

offspring. Germline gene therapy is not currently scientifically possible in humans [3].

There are three various technologies (way) of introduction of the therapeutic genetic design to patient in somatic gene therapy – in vivo, in situ and ex vivo (Tabl.1).

Table 1. Various technologies in somatic gene therapy

In vivo	In situ	Ex vivo
<p>In vivo technology (system introduction through blood) isn't realized yet in practice. It is connected with difficulties in development of therapeutic protocols caused With potential fabric targets (skin, muscles, lungs, brain, liver, cages blood, etc.). Large number of various targets demands creation of specific and effective systems to address the delivery of genetic design.</p>	<p>This technology assumes the delivery of genetic designs (most often as a part of virus vectors) located, directly on fabrics. Two conditions are necessary for this way of introduction: the first being available targets, and the second condition assumes genetic construction had directly gotten in to targets and expressed the therapeutic gene for a long period of time at high levels. Examples:            · gene therapy of cystic fibrosis which is based on local introduction the therapeutic gene as a part of an adenoviral vector in an epithelium of airways;</p>	<p>This technology is based on transplan-tations (or infusion) of own (autologous) cells of the patient. In this approach cells are isolated from an organism and some genetic information is introduced and then returned to the same organism. The most commonly used are the peripheral hematopoietic stem cells of the blood. They have a wide plasticity, easily accessible for collection and subsequent return into the blood. The methodology of using fetal stem cells is currently being studied.</p>

	· introduction genetic engineering constructions to the malignant new growth of the tumor.	
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Gene therapy is directed on the restoration of a function of a gene, an expression which can be insufficient or can be completely absent. In the majority of cases various methods of positive gene therapy are directed at correcting the damaged gene. The following are some of the methods used for gene therapy:

**A. Correction of a gene at the level of DNA chromosome:**

- Restoration of gene function by replacing or duplicating.

This approach can be used for example, at treatment of the recessive hereditary diseases when genes lose function of any gene, and it is necessary for treatment this by restoring the function;

- Reparation correction of genetic defects using chimeric oligonucleotides. Such gene therapy correction has some considerable advantages before other approaches of gene therapy;

- Himeroplastiya – using single or double strands of chimeric RNA / DNA oligonucleotides capable to form homologous couples and to carry out the site - a specific homologous recombination with DNA duplex;

- For correction of genetic defects single-stranded oligonucleotides may be used which does not demand participation of recombinases. One-chained molecules of DNA or RNA can form the stable and specific tertiary structures with DNA due to formation of hydrogen communications with homopurine areas;

- Other type of gene correction is based on a homologous recombination of the small fragments - SFHR (small fragment homologous replacement). For this purpose use one-chained or two-chained DNA fragments with the length of little hundreds of nucleotides, corresponding only to not coding regions.

**B. Extra chromosomal expression of the entered gene:**

- Vector on the basis of a virus of simple herpes (HSV);
- Vectors on the basis of an adeno-associated virus;

- Phenotypic mixing. It is a way, at which the vector designed on the basis of a genome of one virus, pack in capsid with the other virus. This method is applied to increase the number of the formed virus particles, transduction efficiency and specificity of a transduction that is especially actual at a transduction not sharing cages.

- Nonviral vectors nature. For creation of non- viral systems for delivery can be used as sequences of mobile elements – transposons;

- Gene transfer using liposomes - it is possible to carry out the directed delivery of transgenes and other biologically active molecules, based on creation of conjugates of liposomes with antibodies or other ligands. The design including the monoclonal antibodies, or Fab'-fragments of monoclonal antibodies, which received that name.

### C. Other ways of delivering genetic constructs:

- Direct introduction of DNA constructs into the target cells by physical transfection methods, for example electrotransfection. This method is directly connected with electroporation - creation of gaps (time) in a cage membrane;

- Other physical methods of introduction to fabrics of the genetic therapeutic structure – a method of ballistic transformation with the use of gene "guns". However, depth penetrations of genetic designs into fabrics is small, therefore such manipulations carried out with cells of the skin or cells of the hypodermic tumors, a cartilage and cross striped muscles [1].

The risks posed by gene therapy are associated mainly with the vector systems employed. Viral vectors in particular carry an assortment of risks. Viral vectors that are not properly targeted may infect a broader range of cells than are intended. Furthermore, instances where the genes mediating viral replication are not completely deactivated. Beyond the risks associated with viral infection, the non-specific action of gene integration via integrase enzymes presents the possibility of disrupting gene regulation in the host genome, potentially leading to cancer [1].

Despite progression in gene therapy some risks still remain. If these vectors that are mentioned reach germline cells, then the modified genes will be heritable. This has been demonstrated with

HACs in mice, which passed the trait through three generations. Such inheritable genetic modifications present serious ethical dilemmas that will be discussed at length below. One way of avoiding inheritable genetic modifications is to use degradable constructs, although this would require re-administration in the lifetime of the recipient [2].

In the future, in order to reduce the risks of gene therapy, a global task will be required in order to solve these issues. The global task which has to be solved to ensure successful results is extra chromosomal gene therapy; the implementation of addressing the delivery of genetic designs in target areas, that is transfection (in a broad sense) or transduction (when using virus vectors). Transfection can be carried out by using:

- Pure ("naked" ) DNA;
- Built in the corresponding plasmid, or complex DNA (plasmid DNA connected to salts, proteins (transferrin), organic polymers);
- DNA as part of the virus particles which are deprived of the ability to replicate [1].

Thus, development of new technology in gene therapy requires improvement in safe applications with the lowest possible risk.

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## **SECTION V. Engineering**

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### **REQUIREMENTS CONCEPT OF READINESS THE ADAPTIVE SYSTEM OF DIAGNOSTICS FOR USE AT THE ACS**

The requirement for the concept of adaptive algorithms readiness diagnostic system for use at the ACS, and in the future in the ACS, will be understood in the following sense:

- The general architecture of adaptive diagnostic system is represented as two major independent but functionally distinct subsystems PEAI and HPT;
- Computing and logical algorithms HPT built on the principle of minimum necessary sufficiency;
- The use of human factors in diagnosis is limited, as for the subsystem HPT

Marked by three-level diagnostics. This control, diagnostics and diagnostics aging defects. Functions of the first level are determined by its name. As for the other two levels, there is need to note the following.

In adaptive systems for vibration diagnostics adequate technical condition assessment can be obtained without waiting for the results of learning and adaptation of the system to recognize the diagnosis or classification of certain defects. For example, for SBS, which cannot be repaired under the COP, technical inspection is required. At the same time, knowledge of the specific defects responsible for specific technical condition is generally optional (for staff COP). For such cases, the function of technical condition assessment should be built without knowledge of the presence of various defects. Evaluation and classification of the state using the

functions of this form we call the diagnosis of aging. As an example, you can specify the GPA to the aircraft operated. Such units cannot be repaired in a compressor stations. Therefore, it is important here is not the presence or absence of specific faults, and the marks of a technical condition of the basic units of the unit.

The need to use technical genetics occurs most often in the investigation of accidents and their causes. Due to the rapid development of spectral analysis techniques in the last decade to build high performance automated control devices are increasingly used in enterprises and public electric transport. The primary purpose is to further implement methods for improving the reliability, efficiency and quality of operation of rolling stock of public electric transport. Solution of these problems must be due to the improvement of means of technical diagnostics of individual units of rolling stock in the course of their manufacture, operation and subsequent maintenance.

The solution to all these problems is only possible when the diagnosis is performed at the stage of production, operation and maintenance facility. One of the major limitations of devices used spectral analysis is the limited scope of their practical application. They are mainly used to quantify the chemical composition of the individual components of metals and their alloys. At the same time analyzes conducted on the calibration curve constructed for each element of the well-known brands of materials for sets state standard samples (GSO). This leads to time-consuming process of production control, leading to decreased productivity and cost-effectiveness. Furthermore, these direct transformation methods for measuring an input parameter to a percentage of elements not adequately reflect the reliability of the control parameters when evaluating the accuracy of the results. Thus, the entire process of analysis is often limited to the approximate evaluation of the test results.

Technical diagnostic studies methods that determine the actual state of technical objects, in contrast to the theory of reliability, which is engaged in the study and use for calculations middling credible statistical indicators characterizing the technical objects.

The main directions of development of spectral methods can be represented as follows:

- Improvement of existing methods of obtaining measurement information processing, input to the measuring and computing systems in order to increase the level of the desired signal carrying information about the test parameters of the object in the form of quantitative content components, the structural features of the material and its physical and mechanical properties;

- Improving the efficiency of the processing of the output signal of the measuring path through the introduction of computer technology;

- Increasing the reliability of the results obtained by modeling the processes of transformation of the spectral intensity of radiation in a controlled setting;

- Development of high volume, automated measuring and computing systems as part of a process based on the use of modern personal computers;

- The development of new techniques, algorithms and software, contributing to increase the rapidity and the practical application of atomic emission analysis methods.

In the simplest case, the data of diagnosis or their interpretation are the results of comparing the values of signals at the control points with predetermined reference values of these signals.

Information from the means of technical diagnostics (STD), measuring and converting the parameters according to a predetermined algorithm of diagnosis (AD), is supplied to the operator (O) for a decision.



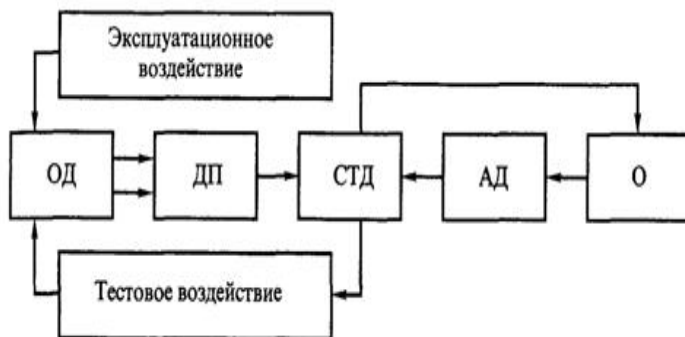


Fig. 1 Block diagram of the system of technical diagnostics of cars and locomotives.

All this means a significant impact on the diagnosis and on the selection of test equipment to achieve high accuracy, increase the volume of data; improve ease of presenting the results of the diagnosis; extending the functionality of devices; the use of different modes of operation systems diagnostics with the wide use of digital methods for solving problems of diagnosis.

For all force fields structure formula to determine the strength of the field is the same. Force fields are described by power lines. On the fixed charged objects, even in the strong magnetic fields no force acts. When the magnetization of the item is passed through a high current low voltage. Iron oxide ( $\text{Fe}_2\text{O}_3$ ) of brown-red color is used to control product with a dark surface. Details having large residual magnetism, a long time may attract the abraded material, which can cause increased erosion wear.

Department STD designed to measure parameters (current, voltage, intensity and the magnetic field, the spectral analysis of vibration and noise, fault detection tools, etc.) of a technical condition of the SS of various design. When the test method signals are formed as a reflection of the external action of the diagnostic tools.

To control the wagons arriving trains designed equipment workstations - the automated workplace inspector cars.

Installation checks analysis of the samples of control and fresh oils. Concentration of elements is determined by the average

values obtained by sampling (measurements) using the calibration graphs.

The calculated value of the diagnostic ratio should be compared with the threshold for each Cj diagnosed node (or parts) of the machine or diesel.

Average concentration (DAC) at the time the prediction is calculated by the formula

$$K_{cp} = \frac{\sum_{r=1}^N K_r}{N} ,$$

Where Kr - concentration of the element in the oil at the r-th sampling point;

N - Number of sampling from the last overhaul of the locomotive or wagon with a diesel engine bulkhead.

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## **OPTIMIZATION OF ION-EXCHANGE DESALINATION OF WATER: THEORETICAL STUDY OF THE INFLUENCE OF THE LIGAND STRUCTURE ON THE ENERGY OF COMPLEXATION**

In thermal power plants (TPP) of high, ultra-high and supercritical pressure, the deeply demineralized water, almost without any mineral impurities, needs to be used in order to compensate for losses in water steam. The high degree of desalination of natural waters is usually achieved by use of ion exchangers, e. g. some insoluble macromolecular substances which possess ionic groups in their molecules and are capable to ion exchange reactions.

Ionite filters are divided into I, II and III stage filters, according to their positioning in schemes of water treatment plants. The first stage of H-cationation is used for exchange of all cations in the given water into hydrogen cation. The second stage is used for sodium exchange, which is "gone" through filter of the stage I, or for the exchange of cations from anionites with low basicity, which appeared in the filtrate due to their aging or poor quality washing out after regeneration. The third stage is used for the exchange of sodium which appeared due to anionites with high basicity.

On first stage anionite filters all strong acid anions are removed which were formed by H-cationation. On next anionite

filters, the absorption of silicic acid and carbonic acid is carried out; also anions are absorbed which can be present in the partially desalinated water after H-cationite filters as a result of unsuccessful washing out after regeneration.

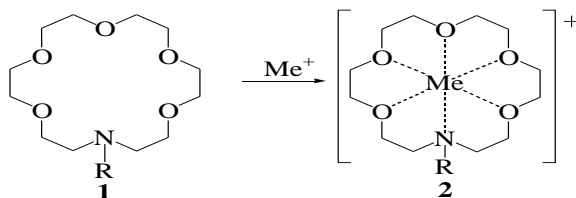
There are many ways to achieve the selectivity in the ion exchange. One of them is the synthesis of such ionites which are able to selective reactions of complexation. By synthesis of ionites it is necessary to create a matrix with functional groups for complexation. This can be done, for example, by previous entrance of special functional group into the molecule of monomer before its polymerisation. The second way is the direct functionalisation of polymer.

There are large number of chelating resins obtained which are based on artificial (polystyrene and its copolymers, polyacrylates) and natural (chitosan) polymers which contain chelating groups that allow to regulate the sorption and desorption processes on different cations [1]. These polymers contain, for example, rests of iminodiacetic acid [2], hydroxyquinoline [3], dithizone [4] and other popular complexing agents.

Crown-ethers are compounds which molecules are cyclic and are able to formation of complexes with metal ions, in some cases with high selectivity.

Despite a large amount of data on complexation of crown-ethers [1], there is a problem to provide sufficient selectivity of complexation by creation of functional materials on their basis. [5]. One of the most successful approaches described to this problem can be use of crown-ether derivatives whose molecules have small structural differences which influences the cavity size and the complexation energy. For example, in the article [6] the influence of structure of compound on the complexation selectivity on N-substituted aza-16-crown-6 derivatives was investigated.

The aim of our research is the theoretical investigation of the influence of substituent size in the aza-18-crown-6 molecule (1) on the stereochemistry of macrocycle and on the energy of its complexation with  $\text{Li}^+$ ,  $\text{Na}^+$ ,  $\text{K}^+$  ions:



R = H (a), CH<sub>3</sub>(b), C(CH<sub>3</sub>)<sub>3</sub>(c)

Me<sup>+</sup> = Li<sup>+</sup>, Na<sup>+</sup>, K<sup>+</sup>

The quantum chemical calculation of compounds 1 and their complexes 2 was carried out; the geometry of molecules was analyzed and the complexation energy was estimated. The geometry optimization was done by RHF with 6-31G(d,p) basis; the Firefly [7] freeware was used.

The cavity diameter in compounds 1 and 2 (Table 1) was defined as the average distance between two most distant heteroatoms in the macrocycle.

Table 1. Cavity diameters and energies of compounds 1a-c and their Li<sup>+</sup>, Na<sup>+</sup>, K<sup>+</sup> complexes.

Ligand	Cation	Cavity diameter, Å		Complexation energy, kcal/mol	Change of complexation energy by entrance of substituent, kcal/mol
		without taking into account Vander-Waals radii	taking into account Vander-Waals radii		
1a	–	5.89	2.85	–	–
1b	–	5.95	2.91	–	–
1c	–	4.70	1.66	–	–
1a	Li <sup>+</sup>	4.37	1.33	-125.18	–
1a	Na <sup>+</sup>	4.52	1.48	-101.73	–
1a	K <sup>+</sup>	5.70	2.66	-80.57	–
1b	Li <sup>+</sup>	4.28	1.24	-136.96	-11.78
1b	Na <sup>+</sup>	4.59	1.55	-114.12	-12.38
1b	K <sup>+</sup>	5.71	2.67	-91.47	-10.91
1c	Li <sup>+</sup>	4.15	1.11	-125.16	0.02
1c	Na <sup>+</sup>	4.91	1.86	-97.54	4.20
1c	K <sup>+</sup>	5.67	2.63	-74.46	6.11

It was established that the entrance of large substituent into macrocycle in 1a-c leads to significant change in the geometry of cycle. Whereas unsubstituted macrocycle 1a (R = H), according to calculation data, has a conformation with pseudo- $D_{3d}$  symmetry (which is typical for 18-crown-6 [8]), the conformation of tert-butyl derivate 1c is significantly different and can be characterized as  $C_2(A-)(g^+, g^-, g^-, g^+, g^-, g^-)$  (Fig. 1).

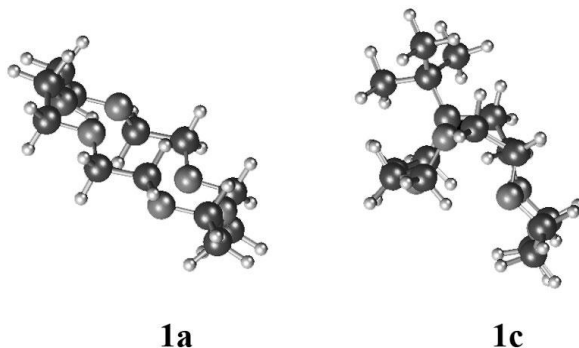


Fig. 1. Conformations of 1a and 1c

The observed change in the geometry of macrocycle is accompanied by considerable reducing in the cavity size inside the cycle and therefore leads to more effective complexation with cations which have smaller Van-der-Waals radius. In general, according to calculation data, the change in steric hindrance in the macrocycle provides the possibility to manage the complexation selectivity, which can be used for intensification of metal ion extraction from water solutions by water treatment.

General trends in developing of methods to reduce contaminants from water treatment plants could be following:

- 1) the development of new progressive methods and schemes of water treatment on TPP, application of them should reduce the amount of reagents used by purification procedure;
- 2) the development of activities to reduce wastewater discharges from water treatment plants;
- 3) the development of effective methods and schemes of wastewater treatment in water treatment plants.

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## **SECTION VI. Economics**

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### **EMOTIONAL INTELLIGENCE AS A FACTOR OF PEOPLE MAKING- DECISIONS**

Nowadays, the different researches of the behavioral economics becomes the trend of the third millennium. Government and different corporations support the interest of this sphere.

Behavioral economics is the modern science that is integrated the key directions of economic and financial analyses using emotional, social and cognitive factors and is studied the influence of these factors on the making economic decisions by person, organization or corporation.

One of the most basic elements of behavioral economics is the emotional theory that has high degree of influence of the emotional status on person's economic decision. Therefore, emotional part plays a significant role in modern life.

The German psychologist William Stern offered to measure intelligence with intelligence quotient or IQ in 1912. In 83 years later Daniel Golman said that EQ is more important than IQ, because EQ is an index of emotional intelligence and controlling under your own emotions and ability to interpret somebody's emotions characterize intelligence more correctly than ability to think rational. According to Golman's works, EQ has decisive influence to the efficient management, because the success consists of 85% of EQ and 15% IQ.

The comparison between EQ and IQ is:

<b>IQ</b>	<b>EQ</b>
Truth	Belief
Facts	Feelings
Contracts	Contacts
Law	Justice
Tips for yourself	Sensibleness
Your summary	Understanding somebody's feelings
Knowledge	Somebody's expression
Talk	Ask
Push	Pull

EQ principles consist of such characteristics as empathy and responsibility, balance and awareness.

Empathy is the main emotional capability. Feeling empathic reactions means identification your emotions with somebody else's, sympathize, and feel with him. Empathy consists of recognition somebody's emotions, understanding somebody's



feelings and giving emotional experiences. How investigations show, the higher level of empathy is better ability to recognize emotions on somebody's face, colors and abstracts images. Developing of empathic reactions is connected to increasing of emotional competence, which can help to everybody to identify one's feelings and communicate with them.

Awareness.

For keeping the emotional balance or in other words, feeling yourself happy, it requires being competitive in your feelings. For it, you have to be able to recognize all shades and nuances of senses differ between productive and unproductive feelings in time of having them. In evolution the person forms own "dictionary" of emotional conditions, learns to express both feelings and their intensity, gets understanding of it's and somebody else's emotional condition.

Balance.

The emotional live's experience saves in brain's subcortex. New subcortex as rational brain analyses and rates situations, determines a possibility of risk or recompense. The main principle of EI theory means that people having a high emotional intelligence can balance two brain parts, connecting together.

Responsibility.

The person with high degree of emotional intelligence is responsible for his own happiness. Emotions make him to get a choice, which can result in definite actions and behavior. Taking a decision is a responsibility for your own actions. Person acts responsibly, if he hurts anybody, controls his ideas, regulates emotions, is responsible for his happiness and do not blame somebody for his unhappiness, recognize somebody's emotions and connects with feelings in a fair way.

To sum up, emotional intelligence is understood as capability to work on information which is consisted of in emotions.

TalentSmart company's analytics (Nick Tasler, Melissa Monday и Lac D. Su), who make researches in the field of leadership using 360° method, found an interesting intercommunication. They analyzed data of 716 managers from companies in different areas such as hospitals, churches, banks,

casinos in their investigation. About 70% leaders (managers) got a high degree of EQ from their directors, staff, colleagues, and are known as the person who make effective decisions. On the other hand, it is noticed that who can keep their emotions, they cannot make decisions. 69%, who has a low level of EQ in that research, coincided with 15% of the worst decision-makers.

Research workers were ready to recognize the difference between leaders with high and low EQ, but they were surprised by such radical difference. It changes leader's knowledge about part of emotional intelligence in making decisions. Nowadays huge number of managers realize (sometimes hardly) that emotions are important in building relations with colleagues, staff, partners, and clients. But not everybody thinks about role of emotions on everyday making decision process. Usually decisions are supposed as rational, suspended, logical, and nearly everybody believe that decisions are in reality. Investigators think that this method is illogical and can be expensive for company.

According to data of researches of TalentSmart, analytics saw a very important conclusion: lack of understanding such emotions of fear, indignation or simply excitement make fence mending harder. It can disturb us in resource investment, making bargain and increase a business. As attachment to research about leadership it means that leaders, who are high-developed in area of emotional intelligence, are able to have all profits from every situation (for example, agree with bargains, which it seems not unjust), responsible for their own area in case of difficulty (admit, that they are responsible for unfair proportion of partition). These leaders have more chances to make a right decision.

We realize that emotions can disturb us in work. Emotions interfere with thinking and react in an adequate way. Emotions are difficult for manage. Strong person is that person who keeps his face look like brick hearing all news. Business is a severe action and has no place for feelings and other weakness. People, who put all efforts for having all emotions under control, realize their abilities as advantage and great achievement.

In that time, according to the latest investigations in sphere of neurophysiology, it is unreal to make decisions without emotions. The famous neurophysiologist Antonio Damasio wrote a

book “Descartes’s Mistake” about it. The book’s name connected with Descartes’s phrase «Cogito, ergo sum» ("I am thinking, therefore I exist"). From position of modern science, the correct variant is "I am feeling, therefore I exist".

Damacio examined people who had injuries of emotional parts of their brains. One of his patients called Elliot hurt his brain keeping ability to think logically, his IQ results did not change. But Elliot has lost to make all decisions, because impulses responsible for making decisions come from emotional parts of brain. Damacio wrote how Elliot had difficulties to choose between Wednesday morning and Thursday day for having a meeting. He had a enormous list of pros and cons of every decisions and was not be able to choose between them.

It does not mean that making decisions depends only on emotions. Intelligence is important for realizing all consequences of choice of every alternative. But calculation of emotional factor can help us to make more rational choice.

To sum up, emotional intelligence is emotional competence including empathy and responsibility, balance and awareness. Necessary condition of emotional intelligence is realizing emotions by subject. The final product of emotional intelligence is making decisions on the fundament of reflection and understanding emotions, which are differentiated assessment of events, which have personal meaning.

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## **BASIC APPROACHES AND METHODS OF ANALYSIS OF FEATURES OF ORGANIZATIONAL STRUCTURE OF FOREIGN AUTO DEALER NETWORKS IN RUSSIA**

As part of the consideration of the various types of network organizations that exist in today's Russian market, we can separately identify a service station (the SRT), having concluded a dealer agreement with the automaker.

As small enterprises, authorized service stations should not be considered only from the perspective of microeconomics. Despite the fact that the dealers usually are independent economic entities and have no legal ties with other similar companies, car dealers who have concluded a contract with the same car manufacturer, are obliged under these contracts meet the same standards in their work, carry out plans for repair and maintenance, selling cars and purchase of spare parts. All these car dealers are starting to be connected with certain common strategy of behavior on the global market and become part of the network.

The articles [6,7] showed unique organizational structure of the auto dealer networks and their difference from other network structures. Thus, among the features of the auto dealer networks can be distinguished close connection of the dealership and the car manufacturer with virtually no hierarchical subordination of one subject in relation to another [2,6,7]:

- dealerships and car manufacturer are focused on different levels of the same market and have different purposes;
- dealerships are not bound by a single owner or a single economic purpose;
- dealerships take on the duty to comply with uniform standards of the car manufacturer on selling and servicing vehicles;
- dealerships bear the main financial risks in the implementation of both its own economic objectives and targets, which the car manufacturer indicates;

- car manufacturer distributes centralized plan for the sale of vehicles and spare parts in accordance with its own view of the situation on the market, leaving the decision of exactly how to achieve the targets at the discretion of the dealership;

- car manufacturer provides access to new techniques and technology in the diagnosis and repair of cars, allows to train staff on special programs that take into account the latest global trends in management, marketing, optimization and management of business processes in the enterprise;

- in case of termination of the dealership contract company (dealership) loses the opportunity to provide warranty services, and as a result, customers with new cars under warranty;

- in case of termination of the dealership contract car manufacturer loses share in the regional car market (some customers may continue the service at the former car dealership company), customer loyalty associated with inconvenience caused by search of authorized enterprises in other regions, as well as bears the additional costs because of the need to train employees of the new dealership accepted standards.

Taking into account the features listed, the research of the structure of such organizations should apply not only to classical approaches to network organizations but also to specialized techniques.

A large number of studies [4,5,8] is devoted to the analysis of organizational structures in the form of economic entities with a common goal and unified management center of the company or enterprise network. One can list the following classical approaches to the analysis of such structures:

- functional approach;
- behavioral approach;
- situational approach;
- information approach.

In the framework of the approaches listed the following methods can be used:

- method of analyzing the structure of the enterprise through the construction of directed graphs, where the nodes of the graph are the divisions of the enterprise, and its arcs are possible variants of interaction between these units;

- method of expert evaluations to determine the correspondence between the chosen organizational structure and actually implemented business processes within the organization [3];

- interviews, surveys and questionnaires of employees and the company's clients, to identify problem business units and "bottlenecks" in the interaction of the various units.

In recent years approach to the analysis of the structure of the network organization developed in the mid-1990s by Robert Kaplan and David Norton is gaining popularity - Balanced Scorecard [1], based on an analysis of key indicators of four interconnected units. All parts of the organization are divided into:

- financial unit;
- unit of work with clients;
- inter-company activities unit;
- unit responsible for the development and training of staff.

For each unit key indicators that assess the unit are selected. We construct the graph that reflects the mutual link of the indicators with those of other units.

In the Balanced Scorecard method the analysis of key indicators and the structure of an enterprise by means of statistical analysis methods is used.

For the study of distributor-dealer system inside the car dealership network it is proposed to use a balanced scorecard approach, combining the various divisions of the dealer and the car manufacturer within the four blocks listed above, regardless of the regional level of the units examined, exploring the relationship of microeconomic indicators of economic activity of the dealership with macroeconomic indicators of economic activity of the car manufacturer.

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## **ECONOMIC COMPETITIVENESS IN BUSINESS: THEORETICAL MODELS AND INDICATORS**

Scientific literature analyzing the competitiveness theory presents several general competitiveness evaluation models. The scientific literature (Porter 1990; Rugman, D'Cruz, 1993; D'Aven,

1994; Weston, Chung, 1990; Balassa 1965; Vollrath 1991) presents a variety of methods used in competitiveness analysis, but they are often seen as separate methods of assessing competitiveness of the country, products and so on.

The evaluation of the country's economy, its individual industries, product, business entity, environment of competitiveness is mainly done by international organizations, independent groups of experts or institutes, studying and determining countries of the world according to their rankings and the achieved competitive position on the market, as well as national experts whose goal is to determine their country's economic competitiveness of businesses and further development trends. Table shows most common competitiveness assessment methodologies. In order to evaluate the applicability of competitiveness models for competitiveness assessment, we will look at these models by evaluating their strengths and weaknesses, and the possibilities of application.

**Table.** Comparison of competitiveness assessment methodologies (Source: compiled by authors)

Method	Substance matter of technique	Applied indicators
M. Porter's methodology (Iloprep, 2000).	Competitive advantages of the economic entity depend on profitability, which depends on five factors.	1) internal factors: demand conditions, related sectors, entity's strategy, structure and competition; 2) external factors: the Government, international activities.
World Bank's methodology (The Competitiveness of European industry, 1999)	In this methodology, the data base consists of 49 indicators, which help to assess the country's economic	1) general economic development indicators (GNP, annual growth of GNP, standard deviation of income distribution); 2) dynamics of indicators of macroeconomic and international economic relations (investment, productivity, export structure);



	situation and opportunities For development of competitive business	3) dynamics of financial indicators (foreign debt; effect of prices on the growth of GNP; securities); 4) infrastructure indicators (telecommunications, roads, electricity), and investment climate indicators; indicators of human resources and intellectual capital development (education, life expectancy, patents).
Methodology of the European Committee (The Competitiveness of European industry, 1999)	In today's quickly changing conditions of the global economy, one of the most important factors influencing competitiveness is the ability to adapt to rapidly evolving technology and to respond quickly to changes.	1) annual changes of production volumes and labour productivity (as a ratio between the value added and the annual number of employees); 2) annual change in employment levels; 3) average annual changes in the growth of production, export and import (when export growth rates are higher than the rate of growth of production and export volumes growing faster than imports, it is concluded that the country's competitiveness on international markets increases or a steady rate is maintained);
Methodology of the European Committee (The Competitiveness of European industry, 1999)		4) specialization and concentration ratios: concentration ratios, Herfindahl index, part of a standard deviation (a measure of sectoral dispersion) coefficients of specialization: Ballassa index, geographical specialization index, dissimilarity index (sum of absolute differences), Gini coefficient.

Methodology of the New Zealand's Ministry of Research, Science and Technology (The World Competitiveness Yearbook, 1996)	The country's economic sectors are divided into four groups according to the technique and technology level, i.e. high, medium-high, medium-low and low technology.	export/import ratio, import penetration and openness to foreign competition; indicators of export specialization, internal sector trade indicator.
Local resource cost methodology (Lietuvos pramonės konkurencingumo įvertinimas, 2000)	Evaluated competitiveness of national economy, sector or product group in the short and medium term. Production is considered competitive if the DRC ratio is less than 1. If the DRC is equal to 1 or greater than 1, products are not competitive.	DRC (output competitive if $DRC > 1$ ). DRC – local resource cost rate.
Methodology of the Lithuanian Institute of Economic (Lietuvos pramonės konkurencingumo įvertinimas, 2000)	Competitiveness is based on the evaluation of Lithuania's foreign trade and industrial performance indicators and their comparison with the corresponding	1) demonstrated comparative advantage; analyzed competitive advantage; share of the Lithuanian export in the EU's exports; share of the EU imports in the Lithuanian exports, total share Lithuanian of exports ; share of goods exported to the EU compared to the scope of total Lithuanian exports to the EU; net income

	EU-15 countries' indicators.	from the exports of Lithuanian goods; 2) labour productivity (by output of products), labour productivity (by value added), labour productivity growth rates; industrial production volume growth rates, employee number growth rates; 3) quality of products, technologies, level of consumer service, innovation, marketing, workforce skills; 4) research and development, manpower resources, qualitative level of access to financial resources, operational infrastructure level.
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In summary, it can be concluded that all given methodologies for competitiveness assessment can be used to evaluate the competitiveness of industries, but also their capabilities in specific sectors of economy are limited due to the lack of information for the calculation of most indicators.

To assess the country's competitiveness, it is necessary to analyse competition between countries. However, firstly, we have to determine which economic sector may have a competitive advantage and a major effect on the country's competitiveness. According to the analyzed authors, it can be concluded that competitiveness is determined by the manufacturing entities' structure, behaviour on the market and adaptation to changing competitive environment conditions. Therefore, it can be assumed that it is very important to select indicators, properly reflecting the opportunities of competitive advantage.

The analysis of the presented competitiveness measurement and application methods was performed in scientific research dealing with separate industries or groups of producers in those industries, or their developed products. While analyzing economic problems of competitiveness, it is necessary to assess the factors

that have a decisive influence on the choice, evaluation and measurement of the level of competitiveness, and its opportunities. After the evaluation of the importance of various sectors of economy, we can distinguish the most important criteria for selecting indicators to measure competitiveness:

1. Assimilation of Lithuanian products in new positions on the EU and world's markets;
2. Need for the State aid;
3. Relationship of product supply and demand;
4. Price dynamics of products and tangible means necessary for the production;
5. Need for investment.
6. The analysis of indicators suggests that it would be appropriate to assess competitiveness according to these indicators:
7. Intensive competition index (S), which allows to compare export competitiveness of two countries industries on the third market.
8. Index of international competitiveness in the branch (RW), showing the distribution of imports and exports in economy.
9. Revealed comparative advantage (RCA), which determines whether economy of any country has the potential in comparison with other branches of the national economy attempting to establish itself on the international market.
10. M. Porter's "diamond" model and OPERA and SWOT analysis methods can be used to solve the issues at the theoretical level, and to find the best solutions.
11. The branch's manufacturing concentration ratio (CR) and Herfindahl index (H), which allow to identify and determine the concentration level and intensity of competition in the branch.
12. Sales growth rate index (UAT), which determines the evolution of the in the product market growth rates over the years and shows the interval in which the values of indicators determining the intensity of competition, and establishing the current market sales growth, can be shared.

13. Market profitability index (RR), which shows how much the product demand exceeds the supply and vice versa. It can be used for planning production volumes and the need for investment to increase competitiveness.
14. Lerner index of monopoly power (L) that shows the extent to which the product seller can influence the product price, i.e. the extent to which the business entity is dependent in the competitive environment and how it affects the profit.
15. Indicators based on the correlation-regression analysis. This method is used to determine which factors have the greatest impact on economic increasing the competitiveness and must be analyzed in more detail. One of them, the correlation coefficient, indicates the strength of relationship between selected variables (Boguslauskas 1999).

It is appropriate to use all the listed competitiveness indicators for assessing the competitiveness in terms of economy, at the level of economic entities involved, and at the level of manufactured products. However, there is a lack of information to calculate all indicators of the system, lack of reliability of such information and it limits practical possibilities of the assessment of competitiveness of the Lithuanian economy.

After the analysis and evaluation of the indicators on competitiveness assessment it was concluded that the best approach for evaluation of economic competitiveness is to use these indicators: a) productivity, structure of an economic entity, production volume, product quality, price level, production cost indicators; b) internal market receptivity and capacity indicators, export changes, labour productivity indicators; c) indicators of the state help level and support of the EU.

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**THEORETICAL PROBLEMS OF ECONOMIC  
COMPETITIVENESS IN BUSINESS**

Recently, there are broad discussions on increasing competition and the country's economic ability or inability to withstand competition in the domestic and foreign markets. Competitiveness of economic entities, companies is associated with their ability to respond promptly and adequately to sudden changes in the market and maintain their position on it. Often, however, there is disagreement as to what particular action should be taken by any individual economic entity in the market competition, which evaluation criteria should be used to determine whether the entity is competitive or uncompetitive and what recommendations should be made to improve the situation.

The production competitiveness of economic entities in the market is determined by the external and internal economic, technological, social and other factors as a whole. On the other hand, it is not enough just to identify the key determinants of competitiveness, it is also necessary to select proper data, metrics and evaluation methods to carry out a coherent and multi-faceted economic assessment of competitiveness by providing a recommendation on how to increase it. Very often, competitive incentive measures are applied in response to changes which have already taken place, so they often come too late and require certain organizational changes in the branch. It is necessary for each business entity which is seeking to develop a successful business and secure development, for a production manufacturer not only to identify the determinants of competitiveness, but also to obtain profit from economical activities, and to consider the support of state for the development of operations in the future, too.

The main premise is that primarily the fit between the business environment and business processes is needed, then both continuous improvement and the proper fit between business process tasks and information systems must exist (Trkman 2010). Organizations have found it necessary to develop ways of managing business rule churn due to new or changed rules from government legislation, business competition, regulatory agencies, industry norms and others; adding to these challenges include increased web-based and global competition making it essential for firms to continuously monitor and rapidly respond as competitive threats emerge (Nelson et al. 2010). The amount of heterogeneous data that is available to organizations nowadays has made information management a seriously complicated task, yet crucial since this data can be a valuable asset for business intelligence, the rate of growth in the amount of information available nowadays within a corporate environment poses major difficulties as well as challenges in decision making (Mikroyannidis, Theodoulidis 2010). Business intelligence consists of a collection of techniques and tools, aiming at providing businesses with the necessary support for decision making (Mikroyannidis, Theodoulidis 2010).

The triad of economic concepts – competition, competitive advantage and competitiveness – reveals the essence of the current

market economy and builds economy as a system that promotes optimal distribution of economic resources and their effective use, and directs its functioning to economic growth and consumer welfare. It can be argued that those elements of the triad became some of the main economic drivers of the market. It is increasingly difficult to compete when development of economic activities and implementation of new technologies takes part along with development of the global market, new forms of competition, and new ways of acquiring competitive advantage emerge, which of course, are more complex.

Today's organizations face new, more demanding business environment, which is often described as unstable, volatile, hostile, and on these grounds unpredictable or even chaotic. New technological and market opportunities arise from the development of science, technology and international markets, i.e. the processes outside of a particular organization. In such a situation the importance of the organization's ability to gain and maintain competitive advantage in the long term is highlighted and the aspiration to acquire competitive advantage and maintain is not possible without adequate environmental strategy (Korsakienė, Grybaitė 2012).

As shown by theoretical considerations (Durand, Giorno 1987; Balassa 1965), and empirical material of various researchers (Porter 1990; Rugman, Cruz 1993; Pitel 1999; Boyle 2002; Pouliquen 2001), the comparative advantage theory can be applied to different levels of economic systems, both single business entities and the industry, both at regional or national level. Competitive advantage is a much broader concept that includes comparative and absolute advantage. Absolute advantage, the ability to supply the market with products at a lower cost than other economic entities, is not sufficient to describe the competitive advantage. Competitive advantage is ensured by interaction of these two forms of advantages. In the conditions of modern market it is not enough to produce a cheaper product, you must be able to deliver better quality, more diverse products, and do so faster than competitors bring their product on the market, i.e. to create a comparative competitive advantage while at the same time creating conditions for long-term competitive advantage, which in turn

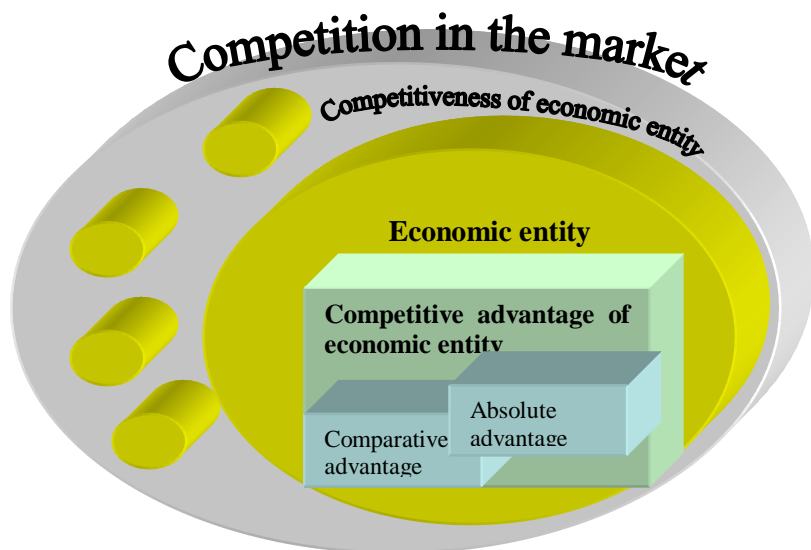


ensures the long term survival of the economic entity in the market, and fixed income. Another group of authors (Pitts, Lagnevik 1998; Havrila, Gumawardana 2003) refers competitive advantage to the entity's ability to operate more profitably in domestic and/or foreign markets, compared with competitors.

M. Porter encourages players to seek advantage in the market, choosing a product differentiation or lower cost, allowing them to get a higher profit on the market (Попреп 2000). Special attention is paid to the formation of strategic competitive advantages. M. Friedman sees the competitive market as impersonal. The business entity in free market is not opponent for another business entity (especially if the products are homogeneous), i.e., none of the participants can dictate the terms which others should follow, or set a maximum comparative advantage with market participants (Friedman, 1998). Comparing M. Porter's and M. Friedman's descriptions of competitiveness and competitive advantage, it should be noted that a problem of definitions arises. In the research (Porter 1990; Rugman 1993; Pitts 1998; Friedman 1998; Boyle 2002), competitiveness is understood in two ways – as an advantage of certain indicators, and as existing benefits of legislation, political, economic, social and other factors. In this way a new approach is formed which involves not the competitive struggle itself, but the ability of market participants to participate successfully in that struggle, i.e., competitiveness. According to M. Friedman, the definition of competitiveness is abstract (Friedman, 1998). It is not related with specific events occurring in a particular place on a particular time, but leads to the summarisation of individual events and the situation, highlighting their common features. For this reason, the term "competitiveness" not only has no single definition, but theoretical and practical authors, studying the phenomenon of competitiveness, use it to define different states of players in the market conditions, to describe them according the same market players.

According to F. Bradley (1996), P. Hardwick (1990), E. Pitts (1998), T. L. Vollrath (1991), D. Aakers (1989), P. R. Ferguson (1994), the concept of competitiveness in economic terms is integral part of the historical, political, cultural and geographical context of globalization.

Summarizing statements of the authors we can conclude that competitiveness is the business entity's ability to operate with a competitive advantage. Since the concepts in the basic triad (competition – competitive advantage – competitiveness) are interdependent, their relationship can be shown in the following diagram (Fig.1).

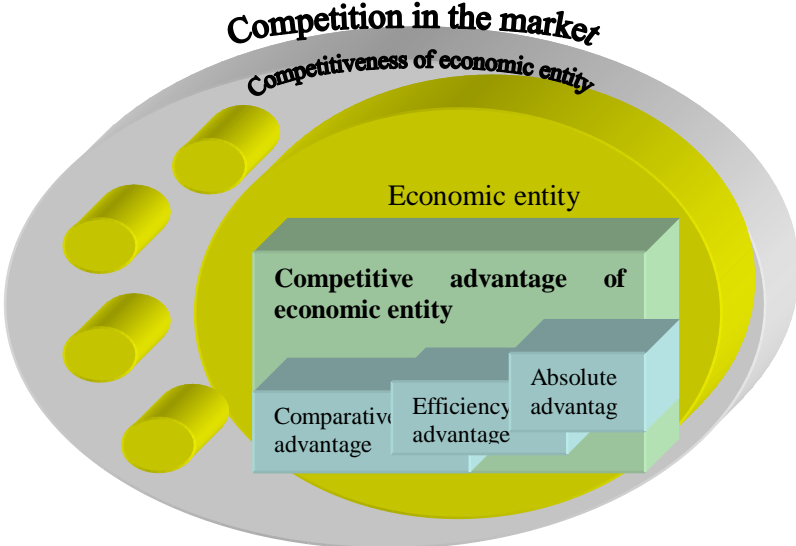


**Fig.1.** Relation between the concepts of competition, competitive advantage and competitiveness (Source: compiled by authors)

In different stages of the development of economic thought, the concept of competitiveness was based on various points of view. The representatives of the classic school A. Smith and D. Ricardo stated in their theories that the absolute (the country providing products to the world at the lowest cost gains a competitive advantage) and relative advantage (market forces directing resources to where they are used most effectively) constitute the basis of competitiveness.

Theoretical studies mainly deal with the following sources of competitive advantage: manufacture of products of superior quality, costs lower than those of competitors, more favourable

geographical position, generating higher value to consumers. Therefore, in order to assess the competitive potential of an economic entity on the market, it is appropriate to supplement the concept of competitive advantage with the concept of effective activities (Fig. 2), which will cover the production efficiency, innovation and mutual compatibility of operations, efficient business management, entrepreneurship of the entity, etc.



**Fig.2.** Competition, competitive advantage (cost advantage), competitiveness interface (Source: compiled by authors)

These elements of effective activities' advantages become very significant criteria of competitive advantage assessment, helping to identify the competitive advantage accurately and clearly. There are conflicting findings in the scientific literature dealing with competitiveness issues in relation to the competitiveness description. Contradictions arise for four reasons. Firstly, factors determining competition between economic entities and competitiveness between states are not identical. P. Krugman argues that "the parties can be satisfied or dissatisfied with their economic situation, because their reasonably defined final outcome

is missing" (1994), in contrast to them other authors (Thurow, 1987) maintain that the higher standard of living among the country's population is the most important result and the factor determining competitiveness.

Secondly, P.Krugman's (1994) view that a single industry or country with high economic growth rate does not reduce the economic level other industries, or states. However, this can be true only during the short period, because in the long term potential losses may incur due to, for example, imported products in demand. Economic growth in the open market depends on two factors: the growth in global demand and manufacturers' ability, in getting a competitive advantage, to compete with other countries (Thirwall 1972).

Thirdly, competitiveness of the country or a block of countries is determined by the countries or groups of countries. All economic entities seek benefit, but their interests are often not identical. Therefore, competitiveness determinants can only describe business features of a single economic entity, part of the industry players etc.

Fourthly, highlighting competitiveness factors and identification of their effects can be considered as a political aspect (legal system, level of state support).

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## **SECTION VII. Philology**

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### **BASES OF PEDAGOGICAL RELATION IN EDUCATIONAL PROCESS**

I would like to propose that the idea of the pedagogical relation may help us better understand the virtues or qualities that are at the heart of teaching. And vice versa, the virtue-like dimensions of teaching are always best understood as inherently relational terms. In order to make the case for the pedagogical relation as the critical dimension of teaching I should first need to extrapolate further the meaning of “pedagogy” and of the “pedagogical relation”. However, without wanting to unduly mystify the situation, I have already indicated that the meaning of pedagogy is first of all a pervasive normative cultural sentiment and that is somewhat of a challenge to articulate this notion of pedagogy in our different cultural setting.

It would be challenging to review the theoretical literature on the pedagogical relation, since the concept of the pedagogical relation has a considerable history - some of it rather obscure - in West European educational theory. I do not intend to discuss this whole tradition of the theory of the pedagogical relation although some of its specifications of meaning may be helpful. In the following paragraphs I will briefly articulate some common features of how the pedagogical relation is understood in certain European educational discourses. Among the few relationships granted to us during our lives such as friendship, love, and fellowship in the workplace, perhaps the relationship to a real teacher is the most basic one, one which fulfills and shapes our being most strongly.

From the teachers' point of view there is often a deep feeling of satisfaction regarding this special relation. And as past students we may feel indebted for the rest of our lives to a real teacher, even though the stuff that we learned from this person has lost its relevance. In part this may be due to the fact that what we "received" from a great teacher is less a particular body of knowledge or set of skills than the way in which this subject matter was represented or embodied in the person of this teacher: his or her enthusiasm, self-discipline, dedication, personal power, commitment, and so forth. A great teacher's influence is sutured into our flesh so that it is now impossible to conceive of our sense of self without this influence.

The pedagogical relation is fundamentally a personal relation. In this relation the adult intends the maturation or education of the child. The pre-reflective or primitive form of the pedagogical relation is already found in various relations of everyday life: in the conversational relation, in the helping relation, and in every event where a certain influence toward formative growth is exercised by one person towards another. The pedagogical relation differs from these incidental formative relations in that the pedagogue is given special responsibility for the young person. As well, he or she reflectively mobilizes his or her conscious will or desire to give direction and shape to such influence.

While our pedagogical orientation to children seems to have lost its bearings, educational programs for adults in all areas of life have multiplied, broadened and diversified. It is more than a pun that this kind of "adult pedagogy" has presently become a growth industry: the business of education is now a concern with all people's learning, adult education, leisure studies, self-improvement, career development, personal growth, continuing education, and so forth. On the other hand, the significance of pedagogy as an interpretive practice derives from cultural contexts that are open and pluralistic. The more complex and troublesome the contradictions of bringing up and educating children, the greater the need for a concept of pedagogy that can deal with these complexities. Educational critics have painted a challenging pedagogical environment. They have argued that pressures from

peers, the commerce industry, and the media have seriously displaced the influence spheres of parents, teachers, the extended family, and the neighborhood.

The pedagogical relation is the concept of a caring human vitality that captures the normative and qualitative features of educational processes. In the accounts of many teachers the informal life of teaching usually overflows the technical rationalizations in terms of which education is commonly framed (such as educational programs, planned curriculum structures, bureaucratic system policies, the management of learning by objectives, and the measuring of instructional productivity by means of results-based tests). It is often said that when teachers close the classroom door they effectively close out certain pressures and influences that are aimed at maintaining external control over teaching-learning experiences.

In the classroom what determines the tone of the lesson foremost is the relational atmosphere between teacher and students. By definition a true pedagogical relation between teacher and students can only be beneficial for the student's growth and learning; however, the relations between teacher and students is certainly not always and everywhere positive in a pedagogical sense. Sometimes we hear teachers express themselves about children in ways that are thoroughly unsettling and that may make us feel discouraged about the possibility of our children receiving a quality education. And, from their point of view, students may sometimes experience a teacher as unfair, uncaring, mean spirited, incompetent, aloof, disinterested, impersonal, or insensitive to their problems and needs.

There are several ways of viewing the nature and function of the informal life of the pedagogical relation. The formal and informal could be seen to relate symbiotically or antagonistically or as a constantly shifting mixture of both. First, it should be seen that the informal, personal, relational aspects of teaching are not just an undesirable accident that interferes with the systematic and planned processes of the curriculum.

Linguistic variation is a central concept in materials and methodology. Sequencing is determined by any consideration of content, function or meaning that maintains interest. Teachers help

learners in any way that motivates them to work with the language. Language is created by the individual, often through trial and error. Fluency and acceptable language is the primary goal: accuracy is judged not in the abstract but in context. Students are expected to interact with other people, either in the flesh, through pair and group work, or in their writings. The teacher cannot know exactly what language the students will use. Intrinsic motivation will spring from an interest in what is being communicated by the language.

Several roles are assumed for teachers in Communicative Language Teaching (CLT), the importance of particular roles being determined by the view of CLT adopted. We can describe teacher roles in the following terms: The teacher has two main roles: the first role is to facilitate the communication process between all participants in the classroom, and between these participants and the various activities and texts. The second role is to act as an independent participant within the learning-teaching group. The latter role is closely related to the objectives of the first role and arises from it. These roles imply a set of secondary roles for the teacher; first, as an organizer of resources and as a resource himself, second as a guide within the classroom procedures and activities. A third role for the teacher is that of researcher and learner, with much to contribute in terms of appropriate knowledge and abilities, actual and observed experience of the nature of learning and organizational capacities. Other roles assumed for teachers are needs analyst, counselor, and group process manager.

Apart from being an interesting example of how proponents of CLT stack the cards in their favor, such a set of contrasts illustrates some of the major differences between communicative approaches and earlier traditions in language teaching.

So, teachers develop their instructional programs. There are certain demands of order and efficiency, and there are certain expectations of favorable results associated with modern institutions of learning. In fact it is only because teachers have timetables, programs, and appropriate expectations of their students that it makes sense to expect of teachers dedicated diligence, patience, trust, and pedagogical tact so that the



timetables, programs, and high expectations do not override the teacher's thoughtful understanding of the child's experience.

CLT is best considered an approach rather than a method. It refers to a diverse set of principles that reflect a communicative view of language and language learning and that can be used to support a wide variety of classroom procedures. Today, CLT thus continues in its "classic" form, as is seen in the huge range of course books and other teaching resources based on the principles of CLT. In addition, it has influenced many other language teaching approaches and methods that subscribe to a similar philosophy of language teaching.

## **SECTION VII. Philosophy of Science**

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### **AXIOLOGICAL APPROACH TO INNOVATIVE THINKING IN THE FRAMEWORK OF HIGHER EDUCATION**

In a climate of reforming of Russian higher professional education system there is a growing demand for innovative thinkers, those who are capable of learning and educating. The innovative thinking is a value, one of the key aspects of a sustainable personality. The definition of "value" (Wert) meaning "significance" appeared in philosophical lexicon in late 19th century, owing for the most part to H. Lotze.

Resurrection of the word "innovation" by economist and sociologist J. Schumpeter as it applies to economic development, followed by the term "innovative personality" introduced by economist E. Hagen and used in the area of science generated a number of various word forms pursuant to the laws of language morphology: innovation

activity, innovative products, innovative thinking, innovative competence, innovative educational technologies. Today the success of different levels of education and progressive advancement of the Russian society in general are largely associated with innovative activity in all social and economic areas and the subject's innovative thinking inherent to these activities. Russian education displays a clear trend to forming a harmonic and innovative personality with innovative thinking. As the obvious complexity of shaping innovative thinking is emphasized, it is also worth mentioning how ambiguous and complex the innovative thinking phenomenon is in the Russian humane studies: philosophy, psychology, culturology, sociology. Below are a number of individual attributes of thinking studied by the Russian humane science and playing a significant role in the development of innovative thinking. The majority of scientific studies of the subject are based on L.S. Vygotsky's historical approach to the insight into human psyche, as well as A.N. Leontyev's theory of activity. In his candidate dissertation "Studies of Psychological Mechanisms of Creative (Productive) Thinking", Ya.A. Ponomarev lay the foundation of the general concept of creativity as interaction that leads to development and is itself a development at the same time. Problems of correlation of intelligence and creativity, creative talent and activity were studied at various times by T.I. Artemyeva (1977), E.A. Golubeva (1986, 1989, 2005), Yu.D. Babayeva (1981, 1997), D.B. Bogoyavlenskaya (1983, 1990, 2002), V.N. Druzhinin (1990), M.A. Kholodnaya (1983, 2012), D.V. Ushakov (1999, 2011).

For the last decade, philosophy and psychology have been taking up the challenges of the time: a lot of researches emerged, addressing the issues of education philosophy, value of thinking as it applies to innovative activity, innovative personality, innovative thinking (Yu.B. Gippenreiter, V.F. Spiridonova, M.V. Falikman, V.V. Petukhova, 2008; M.V. Klochko, E.V. Galazhinsky, 2009; T.D. Kim, E.S. Pervukhina, 2010; M.V. Volkova, 2010; M.A. Aleksandrova, 2010; S.R. Yagolkovsky, 2010; M.V. Serbinovskaya, 2012, A.P. Zapesotsky, 2013).

M.S. Kagan (1997) believes it is wrong to consider a value something that is useful, something that provides benefit. "... benefit (use) is a positive meaning of one object for another object, and hence the benefit itself is as objective as the truth, it can be substantiated and

disproved by science... [4. p.76]". The benefit (use) is a praxiological category, and value is axiological [4].

A large number of humanitarian studies concern creative thinking resulted by an unconventional product with new distinctive features. Some researchers consolidate the definitions of creative and innovative thinking, describing both as manifestations of one and the same process. Others believe that the two are not exactly as close as are often thought to be and require more in-depth research endeavors. Almost all researchers, however, differentiate creative and template thinking, the latter being based on stereotypes. If the thinking reaches beyond the narrow bounds of cliches and algorithms, this is where creative thinking emerges, identical to innovative thinking. The features of uniform thinking manifest as distinctive ones within the framework of innovative activities. It is a sort of insight. According to A.P. Usoltsev and T.N. Shamalo, if under certain hypothetical circumstances the innovative thinking loses its creative component, it ceases to be innovative [8]. The most frequently occurring antithesis - template (standard, stereotype) thinking versus creative and innovative thinking - is substantiated by empirical studies [1].

From the standpoint of economic science, innovations are a product that significantly alters the existing system of any activity, whether it be bachelor or master training course at a university or food production. This concept is common for such a thing as inventions. However, does every product of creativity yield a commercial result? It is by far not always the case, and one's handiwork may be unappreciated by contemporaries or forgotten for many years. Moreover, innovative proposals may also be found faulty or inefficient and stop being treated as innovative. Alternatively, context or sphere of application may change, or other time may arrive when the forgotten innovations eventually find demand.

To better understand the mental process, many attempts were made to distinguish innovative thinking as a separate kind, to identify and tell apart creative and innovative thinking, to define unconventional thinking as unique and inherent to just a few. Since J. Guilford divided thinking into convergent and divergent, the latter has been perceived as the source of creativity, because the process of solving any intellectual problem in this case is based on multiple solutions. Divergent thinking is the ability of creativity, a structural basis of a creative personality

(B.G. Ananyev, 1945). Innovative thinking, or, entrepreneurial spirit as it is often referred to, is biologically inherent to only a few people, but can be developed, especially during sensitive periods of developing such personal traits as independence, responsibility and initiative. J. Piaget (1923, 1932) emphasized a connection between periodicity of a child's personality development and phases of intelligence development. In her theory of early development of children, M. Montessori (1912) identified the most favorable age-specific periods of personality development and believed, for instance, that children develop their independence over time, since birth till the age of 5. The Russian psychology associates this with age crisis periods: the crisis of three years is the "I'll-do-it-myself" period when the foundation is laid for inherent value of personality, and cognitive abilities are actively developed.

Innovative thinking as an urge for self-actualization is also considered as a source of innovative activity. The prerequisites for innovative thinking are the urge to satisfy various aspects of Maslow's demand model and self-actualization. Self-actualization, as it is perceived by the founder of humanistic psychology, is mainly inherent to people of age, and the youth are "growing personalities". In his classic work "Motivation and Personality" (1954), Maslow makes two direct, seven illustrative and several potential examples of self-actualization. The need for self-actualization drives a person to unleash their talents and satisfy, in the first place, their existential needs. However, satisfaction of deficiency needs can also be reached through innovative activity. The origin of innovative mental process is a problem that requires solution, fortified with the need. "Finding a problem in something that may seem already discovered, something that is already known, is a very important manifestation of pungency of wit, rational faculty. This is the point where thought must emerge from - the ability to raise a question, to identify problems, and to distinguish knowledge from lack of knowledge" [1. p.68]. A problem may be recognized more or less clearly. "Recognition of a problem situation may begin with a surprise (where, Plato believed, all knowledge begins) invoked by a situation that made an impression as an uncommon one. Such surprise may result from an unexpected failure to perform a familiar action or to behave commonly". [7, 374]. Statement of a problem is an intellectual task; a distinctive feature of an intellectual

person is the ability to find problems in one's conventional and established behavior and activities. An inquiring mind always seeks problems to solve. Only those who are not accustomed to thinking independently do not see any problems - only idle-minded take everything for granted [5, s.51]. A.M. Matyushkin in his research (2003) underlines the importance of inner motivation and personal urge of a subject for exploratory thought aimed at solving problems. Subject of innovative thinking is setting a goal and reaching it, key prerequisites for which are pragmatic self-awareness, personal initiative and wish to expand the boundaries of own competence [6].

A special emphasis is placed on interest, inherent and developed curiosity as the key stimulus for the emergence of "intellectual sense", intellectual activity commingled with positive and negative experience of success or deliberateness. The thinking is also conditional upon "the element of will", which is manifested in psycho-physical effort (N.D. Vinogradov, 1916). The efforts of will direct a person to developing their newly emerged interest, when the initial interest diminishes and the person becomes indifferent to the problem that occupied them earlier. It is a journey from inspiration to development of an idea and its materialization. In real life, a number of excellent ideas never see implementation. This is resulted by complications that emerge on the way, such as self-doubt (Jonah complex), lack of self-organization and self-education. Let us look at the Jonah complex, the key provision of the self-actualization theory. According to Maslow, this wide-spread mental phenomenon prevents a person from showing their creative abilities, that gift of God, talent that fails to show in full due to various, often illusory, constraints. The foundation for this phenomenon was laid by the myth of prophet Jonas who was marked by the God and received mission to sermonize to sinners, but became afraid of the greatness of that mission and fled in fear.

Philosophic vision of innovations comes down to studying their nature, pre-conditions and reasons for their emergence, recognition of the importance of innovative activity to a human. M. Verberg's theory of social activity, as well as some aspects of K. Marx's theory [9], may also be considered in this context. Is we speak about the philosophic aspect of innovative thinking, S.A.

Lebedev's and Yu.A. Kovylin's study "Philosophy of scientific and innovative endeavor" (2012) is worth mentioning. It covers the structure, categories and conditions of efficient innovations in science.

Not only does innovative thinking manifest itself in readiness for innovative activity, but also in positive attitude to different innovations. L.D. Tsitsyulskaya (2005) mentions controversies serving as psychological barriers as it applies to innovative thinking and behavior in the area of education: there is misalignment between the need of educational institutions in innovator teachers and innovative activities and opportunity for the teachers to implement this idea, both on personal and professional level. The experience and scarce studies of the area of professional education confirm only theoretical adoption of innovations accompanied by latent misunderstanding and non-acceptance. Currently, it is uncommon to question or even criticize the need for innovations, which pushes a person directly to non-conformism.

It is difficult to make an example of a society where personalities with unconventional way of thinking would be willingly accepted, especially when an idea is first introduced.

Undoubtedly, an innovative thinker feels psychologically in a friendly, that is, innovative environment. Similarly, if there is no place for progressive incentives in the system of human values, then even authoritarian methods will be unable to make them innovative. Another approach assumes attracting a person, show them the benefits of innovative thinking, help discover the potential and help get over the fear of creativity. The lack of innovative environment of like-minded people results in person's looking for a better fate some place else or giving up on their idea. "If they truly value new ideas and innovations, then such organizations are subject to constant changes, benefiting from implementation and use of new ideas and technologies. We can say that in such cases the subject of innovative activity (whether it be a person or a company, a structure or society in general) and the innovation are "drawn" to one another" [9, p9].

Let us look in detail at innovative thinking as a standalone kind of thinking that "maintains" pioneering endeavors. A.P. Usoltsev and T.N. Shamalo (2014) believe that understanding of the specifics of thought is

a key to successful fostering and preparing the young generation to innovative activities. Features of unified thinking change depending on the specific requirements of intellectual task. Understanding of innovative thinking as a style of thinking reveals the natural integrity of this vital cognitive process, as well as distinctive features of unconventionality. Innovative thinking is distinguished by the following inherent features: it is scientific and theoretical, creative, constructive, socially positive, reforming and pragmatic [8].

Let us now look into the problem of correlation of innovative and adaptive thinking. The structure of innovative behavior of a person shows elements of adaptation, especially when it comes to analysis of obvious and latent motives. However, the definition of adaptation interpreted by science as inner urge to preserve homeostasis is in conflict with the definition of innovation and may complicate the process of creating innovative products.

Innovative thinking and adaptive thinking are not equal. At the same time, satisfying personal needs may stimulate innovative behavior resulting in acute manifestation of all traits, supported by sustainable motivation that active adaptation demonstrates.

Culture of thinking is the most important means of reflecting logical associations. In this area, innovativeness manifests in deliberate use of specific principles of mental activity that are dictated by the level of social development. Adhering to these conventional principles will lead to the development of innovative thinking and culture of thinking. Some of the key principles are "... sustainable expansion, deepening and renewal of knowledge; conscious searching and selection of information; ability to see the old in a new way; compensatory-prognostic approach to solving practical problems; systematic analysis of facts and events; ability to focus one's thought on a narrow area; combination of conceptual and scientific, as well as image-based and artistic vision of life phenomena; intellectual tolerance; sense of humor, wits, etc." [2, 5, 53].

Having looked at different sides of innovative thinking, let us go back to the roots of this cognitive process - the thought itself. The thought is intention, representation, "individual activity of mind" (V.I. Dal 1863-1866), notion, intention, idea, opinion, judgment, conclusion as the result of thinking. The thought reflects

interrelations between objects and phenomena of material and ideal world, which are only understood by the subject. Innovative thinking as an aggregate of thoughts about the need for changes and means for reaching them, about forecast of results. V.D. Shadrikov explains principles of relations between thought and image, emphasizing the relevancy of incorporating the definition of "thought" in the inventory of categories of psychological science [8].

The objective of humanities knowledge is to help a person come to thinking about timely changes in approaches to activity, urge a person to change their way of thinking to active and creative, thus "...fostering a mature and free personality" that can be called innovative with a good degree of confidence.

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## **SECTION IX. Jurisprudence**

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### **TO THE QUESTION OF THE ESTABLISHMENT OF FOREIGN LAW CONTENT IN CONFLICT REGULATION OF THE REPUBLIC OF KAZAKHSTAN**

Procedure of the establishment of foreign law content differs considerably from the procedure of establishment of local law content. As for the latter “*iura novit curia*” principle is applicable, since the court knows the local laws [1, P. 52-54]. Another question is the establishment of content and enforcement of the foreign law, which by itself has no obligatory force in this government, but is applied on the bases of conflict rules.

Legislation of the Republic of Kazakhstan in the sphere of regulation of the establishment of foreign law content proceeds from principles of continental theory. For instance, according to paragraph (1) of the article 1086 of the Civil Code of the Republic of Kazakhstan “applying foreign law the court establishes its content in accordance with its official interpretation, practice of applying and the doctrine in the relevant foreign state”, i.e. the court is obliged to establish the foreign law content by virtue of its official duties. It should be noted that a law-enforcing official is free in using variety of methods during procedure of the establishing of foreign law content. For example, for the purposes

of establishing the content of foreign law the court may seek for assistance and explanation of the Ministry of Justice of the Republic of Kazakhstan and other competent bodies and institutions of the Republic of Kazakhstan, including those which are abroad, or may hire experts, as it is set out in paragraph (2) of the article 1086 of the Civil Code of the Republic of Kazakhstan. In solving the problem of establishing the content of foreign law an important place is given to the interaction of states in this field and it we have to emphasized the importance of bilateral and multilateral agreements on cooperation, information exchange and intergovernmental legal support, in which, as a rule, the states give a guarantee to provide each other with information on legislation. In addition above mentioned sources of information on foreign law content include legal literature, legal judgments, legal directories, citations on laws in the global network Internet [2, P. 94-97]. However, it should be noted, that the reliability of these sources should be verified by the court itself, otherwise there is a risk to apply the law, which has no force currently (out of date, changed and etc.).

Thus, the legislation setting up an obligation to the court to establish the content of foreign law, as it is called, “ex officio”, gives him multiple opportunities to choose methods for establishing what is contained in this or that legislative act, proceeding from a foreign state. At the same time, according to paragraph (3) of the article 1086 of the Civil Code of the Republic of Kazakhstan “persons who participate in a case have the right to submit documents, which confirm the content of foreign law to which they refer to substantiate their claims or objections and in any other manner to assist the court to establish the content of that law”. This provision fixes only the right of parties, so they are not obliged to prove the content of foreign law, determined as applicable or to which they refer. At the same time we think that when the dispute is associated with business activity, it is in the interests of the parties to render the content of law rules, which are not known to the court. According this, we suggest to complete paragraph (3) of the article 1086 of the Civil Code of the Republic of Kazakhstan by the following sentence: “In disputes, arising from business activity, the burden of proving the content of foreign law

which is considered to be applied or which is chosen by the parties as applicable, shall lie on the parties of the trial”.

The legislation of the Republic of Kazakhstan also provides the consequences of failure to identify the content of foreign law, so paragraph (4) of the article 1086 of the Civil Code of the Republic of Kazakhstan states, that “when content of foreign law in spite of measures undertaken in accordance with this article within a reasonable period of time is not established the law of the Republic of Kazakhstan shall be applied”. So, not all attempts of the court or of the parties to establish the foreign law content can culminate with positive result. In this case, conflict regulation of the Republic of Kazakhstan prescribes to apply *lex fori*.

As Sh.M. Mengliev notes, such rules appear to be more acceptable, since relations won't remain unregulated and therefore will receive an adequate solution, and, at the same time, will eliminate uncertainty in any private law relationship with foreign element [3, P. 211-212]. Thereby, referring to the failure to establish the content of foreign law, there is noted, that if there is no way out, then as *ultima ratio* (i.e. in extreme case) only *lex fori* remains, however not because of the assumption that the foreign law coincides with *lex fori*, but just because of necessity to find a way out from the situation [4, P. 131].

But there are still remain the questions, such as: clarification of the meaning of “reasonable period of time” in paragraph 4 of the article 1086 of the Civil Code of the Republic of Kazakhstan; also, how to prove, that the court has taken or, conversely, did not take all possible measures to establish the content of foreign law and how to evaluate the effectiveness of measures taken?

The category “reasonable period of time” can be classified as so-called evaluative concept. Therefore, the definition of “reasonable period of time” concept, along with such concepts of private international law, as public policy and mandatory rules, is a subject for discretion of the court, and, of course, in all above mentioned cases should not be equal with “abusive practice” of the court. In M.K. Suleymenov's opinion, the reasonableness of the period of time is determined by the court depending on the complexity of the trial and the time needed to resolve it [5, P. 674]. Consequently, reasonable period of time within which the content

of foreign law should be established is identified by the court in each case depending on facts of a case, on existence of international agreements with the appropriate State and on assistance from state bodies (in particular, from the Ministry of Justice), on access to information on foreign law, whether the parties themselves provide support to the court and etc. Thus, the list of factors that determine “reasonable period of time” in this or another case remains open.

Regarding the measures taken by the court in establishing the content of foreign law, it is fair to say, that, of course, a judge does not have to know the laws of all foreign states, since it is not within his direct duties. And there are such opinions that as a result of the procedure of the establishment of foreign law content the foreign law ceases to be itself [6, P.113-114] and that in all countries there is a problem of evasion of courts from the application or, at least, the proper application of foreign law by reason of similarity of the legal systems in many countries, especially in commercial matters, or because it is impossible to understand its content without knowing the legal culture of the country and its legal system [3, P.46-47]. However, we are talking about the application of foreign law “ex officio”, and the determination of its content is already mandatory for a judge.

Importance of the institution of establishment of the foreign law content is in the ability of further correct application of the relevant rules of the substantive law of the foreign state to the facts of the case. And, despite the complexity of the process, the judge, following to the requirements of national legislation, is obliged to take all measures for appropriate regulation of the relationship with foreign elements.

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## **CLASSIFICATION OF CHILDREN'S RIGHTS IN UKRAINIAN LAW**

The rule of law, democracy, and human and civil rights are the basis for any legal state. Article 3 of the Constitution of Ukraine stipulates that the highest social value is a person, his or her life and health, honour and dignity, integrity and safety [4]. Therefore, a very important role in the formation of civil society belongs to human and civil rights. They are also immediately related to realization and defense of children's rights. On the one hand, children are the least protected part of the population, but on the other hand, they are the future of any state. Thus, it is essential to define their legal status (that is, their legal position within society and family), to secure it in the government's legal framework, and to establish the mechanism for realization of the declared rights. This is the reason why many Ukrainian scholars studied this issue.

The basic principles for defense and protection of children's rights were set in the "Convention on the Rights of the Child" adopted in New York on November 20, 1989 by the UN General Assembly [2]. They include:

1. equal rights for children and provision of children's defense from all forms of discrimination;
2. the best assurance of meeting child's interests (priority of child's interests in resolving of any issues concerning the child);
3. the government's provision of the best possible conditions for the child's survival and healthy development;
4. protection of the child from illegal abuse of narcotic and psychoactive substances, as well as non-admission to their illegal production and distribution;
5. protection of the child from all forms of sexual exploitation and sexual corruption;
6. prevention of children's kidnapping and trafficking for any purposes and in any form;
7. assistance in physical and psychological recovery and social integration of the child that has suffered any kind of negligence, exploitation or abuses;
8. inadmissibility of torture or other cruel, inhuman or degrading treatment of the child.

According to Polish researcher Alžběta Ciz, "children's rights belong to the category of human rights and spring from dignity and uniqueness of the child as a human being" [7, p. 5]. Besides, she believes that children's rights need to be considered from the viewpoint "authority—personality", not through the lens of "child—parents" relationship [7, p. 5—6].

Ukrainian scholar, V. N. Shapovalov [8] suggests to classify all the rights according to the following characteristics:

1. in terms of relations that emerge due to their realization:
  - ❖ personal;
  - ❖ political;
  - ❖ economic.
2. in terms of generation:
  - ❖ first generation rights (personal and political rights);
  - ❖ second generation rights (social and economic rights).

In his textbook "Constitutional law of Ukraine" [5] V. V. Kravchenko divides all rights, including children's rights, according to the following characteristics:

1. in terms of subject:
  - ❖ human rights;

- ❖ civil rights.
- 2. in terms of genesis:
  - ❖ natural;
  - ❖ derivative from natural.
- 3. in terms of absolutization rate:
  - ❖ subject to restrictions by law;
  - ❖ non-subject to restrictions by law.
- 4. in terms of education type:
  - ❖ basic;
  - ❖ additional.

While studying the matters of human and civil rights classification, including children's rights, a well-known Ukrainian scholar in constitutional law Yu. N. Todyka [3] reckoned that all rights are classified according to the following characteristics:

1. in terms of subject:
  - ❖ human rights and freedoms (the right to life, to citizenship etc.);
  - ❖ civil rights and freedoms (the right to labour, to leisure, to education, to access to information etc.)
2. in terms of subject type:
  - ❖ individual (e.g. the right to housing);
  - ❖ group rights.
3. in terms of genesis:
  - ❖ natural (e.g. the right to life);
  - ❖ derivative (e.g. the right to information).
4. in terms of creation:
  - ❖ constitutional (basic);
  - ❖ additional (specifying).
5. in terms of absolutization:
  - ❖ subject to restriction by law;
  - ❖ non-subject to restriction by law.
6. in terms of content:
  - ❖ individual;
  - ❖ civil;
  - ❖ political;
  - ❖ economic;
  - ❖ cultural.

We believe this classification to be the most comprehensive one. However, it is universal and does not distinguish children's rights from general rights and freedoms. Yet, it is necessary to develop a separate set of rights for children. Unfortunately, hardly anyone has looked into it. V. N. Anisimov is one of the few Ukrainian scholars who provides the following classification of children's rights [1]:

- ❖ physical (the right to precedence for protection and assistance, inadmissibility of certain kinds of criminal penalties, including death penalty);

- ❖ individual (the right to knowing one's parents and to non-separation from them);

- ❖ cultural (the right to relevant games and institutions for children);

- ❖ economic (the right to non-engaging in labour until reaching certain age);

- ❖ political (the right to not being called up for military service until reaching certain age).

Besides, today there is a classification of the notion "child" in terms of age. Thus, according to paragraph 2, Article 6 of Family Code of Ukraine, a child is considered to be a minor (until the age of 14), and underage (from the age of 14 till the age of 18) [6]. Such classification is also used in many international documents, as well as in the Russian law. Ukrainian researcher O. A. Shulz [9] believes that childhood in terms of age can be divided into infancy (until the age of 1 year), early childhood (until the age of 3), preschool age (until the age of 7), primary school age (until the age of 10-11) and early adolescence (until the age of 18). By the way, the same classification also applies in pedagogics.

In our opinion, all children's rights can be classified according to the following features:

1. in terms of content:

- ❖ natural (inalienable), including: the right to life; to name and to citizenship; to education; to high living standards; to freedom of speech; to information; to protection against all forms of violence; to access an egress for the purpose of family reunion etc.;



❖ economic, including: the right to property; to manage the income from one's property; to entrepreneurship (in accordance with active legislation); to apply for certain kinds of jobs (in accordance with active legislation);

❖ social, including: the right to contact parents and other family members living separately and in other countries; to free legal assistance; to healthcare and free qualified medical aid in state and municipal health facilities; to use of social benefits, including social insurance;

❖ cultural, including: the right to education; to freedom of religion; to rest; to leisure and participation in cultural and artistic life; to education in native language; to the use of domestic and world developments in culture and arts; to scientific, technical and artistic endeavours;

❖ political, including the right to enter and participate in the activity of children's civil unions.

2. in terms of defense of rights:

❖ administrative and legal;

❖ criminal.

3. in terms of needs:

❖ the rights of children with common needs;

❖ the right of children with special needs (orphan children, children deprived of parental care, adopted children, children separated from their families, homeless children, disabled children, refugee children, children requiring additional protection, and children requiring temporary protection).

Apart from general rights all these children have special rights based on the *parens patriae* principle. Thus, children deprived of parental care (adopted children) have the following rights:

1. the right to live in the guardian's family and to his/her custody;

2. the right to conditions necessary for balanced growth, upbringing, and to respect of the child's human dignity;

3. the right to protection against abuse by the guardian;

4. the right to the reservation of right to pension, other social payments and restitution of damage following the death of the guardian that he/she had before adoption;

5. the right to alimony, pension, other social payments, as well as to restitution of damage following the death of the guardian, that he/she had before adoption;

6. the right to maintain personal contacts with parents and other relatives except for the cases where it may damage the child's life, health and moral upbringing;

7. the right to balanced growth, upbringing, education, respect of the child's honour and dignity;

8. the right to housing or to receiving it according to active legislation;

9. privileges in employment.

According to the law, orphan child has the following rights:

1. the right to balanced growth, upbringing, education, respect of the child's honour and dignity;

2. the right to housing or to receiving it according to active legislation;

3. privileges in employment;

4. the right to special protection and assistance from the government.

According to the law, orphan child has the following rights:

1. free medical aid;

2. various privileges from the government;

3. respect of the child's honour and dignity.

Therefore, the following conclusions can be drawn:

10. Children's rights are an integral part of human and civil rights, because children are the least protected part of the population, and, consequently, require legal and social protection the most.

11. The basic principles of children's rights protection are set out in the Convention on the Rights of the Child.

12. Many Ukrainian scholars have been working on human and civil rights classification, however, hardly anyone of them has ever distinguished children's rights classification separately.

13. Today three major directions may be singled out in children's rights classification: in terms of content (individual, economic, social, cultural), in terms of defense of rights (administrative and legal, criminal), and in terms of needs (the

rights of children with common needs and the right of children with special needs).

14. Unfortunately, nowadays Ukrainian law lacks legislative securing of rights for such children with special needs as refugee children, children requiring additional protection, and children requiring temporary protection.

15. Therefore, we need to systematize active legislation in the field of legal regulation and realization of children's rights based on the abovementioned classification in order to create a legal state.

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## **SECTION X. Educational Sciences**

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### **SELF-KNOWLEDGE OF STUDENTS AS AN INTEGRATIVE FACTOR OF EDUCATION: THEORETICAL ASPECTS**

The understanding of education through the lens of spiritual activity has important methodological significance to prove this idea. Students obtain their spiritual values by reading various books, articles, and listening to teachers. In gaining these spiritual values, it is advisable to categorize the attainment of spiritual values as direct, indirect, and final. Direct gaining of spiritual values such as theoretical and applied knowledge is related to students' perception, understanding, and assimilation of these values. The purpose of directly obtaining scientific knowledge is the formation of a student's scientific view of the world, which is a form of systematic knowledge and encompasses general scientific or philosophical and local scientific levels. In the logical-methodological aspect the scientific view of the world is a methodological framework for the analysis of the object and determines the categorical system of thinking, for instance, for biologist, teacher, and so on., and in a particular area of knowledge it acts as a certain style of thinking. The federal state educational standards and state educational standards are a kind of scientific viewpoint of the specialties, because they are epistemological images of specific activities and unique regulatory models of the self-concept of future specialists.

Each student with the intermediate gaining of scientific knowledge should become a conscious subject of his/her self-realization, learning not only the outside world, but also himself/herself. This is the law of life of each person. However, in

order for the students to learn themselves, they have to rely on the present general scientific and local scientific views of the world.

Knowledge encapsulated in these pictures of the world, serves as a methodology of self-knowledge, and carries out the methodological function in it. It is in the process of implementation of methodological function by this knowledge by which its indirect and intermediate obtainment begins.

Self-knowledge of a student takes place at two levels. The first is the level of self-universal and the second is the level of self-unique. Self-universal is put into action incorporating the knowledge that every individual is a microcosm reflecting the cosmos, a microcosm, which to some extent is an echo and mirror of the world, the unity of the universal, general and single (unique). That's why all of the existing sciences, exploring the world, at the same time, are exploring a human as well. Moreover this applies not only to social and humanitarian sciences, but also to the natural ones. In a human, as in nature, there are the laws of gravity, of conservation and transformation of energy, of electromagnetism and metabolism, and others. Thus, all of the sciences simultaneously create a view of the world (large circle), and a view (image) of a person as a subdivision (smaller circle in a big circle.) Furthermore, the same sciences create the view of universal (general and common) that is inherent in every human individual. In this regard, every student studying various sciences (disciplines), should deeply realize (and teachers should help him/her) that he/she at the same time is studying and exploring himself/herself, but is doing this only from a universal point of view, common to all people or their large groups. Then, the student thinks as follows: «If a human generally has, for instance, morality, verbal communication, and so on., and I'm also a human being, then these qualities are inherent in me». Therefore, each student, upon gaining scientific knowledge, at the same time builds a personal view of the world or an image of self-universal, which reveals himself/herself in terms of the universal. A fundamentally important conclusion follows from this: «All sciences, which students study, are not only the sciences of the world, but also the sciences of their self-knowledge». While understanding this truth the student begins to develop a personal interest in the study of

various sciences, that is the realization that one does not study some biology or ethics in general, but that by studying them at the same time student knows himself/herself, and explores «self»-universal. The personal interests of the student in the study of academic disciplines (sciences) is even more magnified when one realizes that acquired knowledge about the self - universal acts as a methodology of knowledge of the self – unique. That is the particular and unique, which is characteristic only for him/her. The permanent self-knowledge work of students in the study of various disciplines leads to the formation of academic self-concept, which is a system of subject, evaluation and project self-determinations. Thus, it is crucial to understand the following:

1. Making self-knowledge of students possible in the education system is not only limited to reading a single course on self-knowledge. Sciences about self-knowledge of students are all academic disciplines, the subject of which is a human, fully or to a certain extent.

2. The task of teachers is not limited to the transfer of knowledge and ensuring its assimilation. The task of teachers, in my opinion, is to organize the use of scientific knowledge for exploring "self"- universal and "self"- unique and construction of individual self-concepts.

After that, they should organize students' self-education on that basis (for example, based on the study of communication – formation of communicative self-concept).

3. Student's self-knowledge of his/her uniqueness (specific needs and opportunities) creates some prerequisites of selective and critical attitude to the experiences of previous generations, including judgments of their teachers and their impact on students. All this creates the preconditions for individual creativity of students and their cultural-constructive activities.

4. Self-knowledge of students, which is of key importance, acts as an immediate base for all kinds of self-realization. This is due to the fact that the results of self-discovery, primarily in the form of designed knowledge about themselves (self-projects) determines not only the objectives of the different types of self-realization and the means to achieve them, but also the tools of their management, their conscious regulation.

How does the educational process continue further? Mastering of scientific knowledge and the production of knowledge about themselves is a necessary but insufficient condition for transition to the implementation of this or that practice, to self-realization. Subjectivity that hasn't been formed for this self-realization is the very condition. Self-education of a student is the main means of conscious development of the subjectivity. The basis of self-education, on the one hand, is the using and mastering of spiritual values in the form of various kinds of regulatory knowledge in the process of self-learning, and additionally, getting self-knowledge in the form of various kinds of self-projects. Thus, the spiritual foundation of self-education is education, self-learning, and self-knowledge. The immediate goal of self-education is the creation of self-subjectivity to all kinds of self-realization, including self-learning and self-knowledge. The subject of self-education of students is the system of qualities. Qualities of a personality are formed human abilities allowing the student to affect the object (subject) and interact with it. These include: 1) terminal qualities (goals, motives, etc. 2) tool qualities (skills), and 3) characterological qualities (character traits). All knowledge of a student about the world and himself/herself transforms in his/her productive essential powers only through the qualities. Therefore, qualities of a personality, or subjectivity as their integration, act as causes in all activities. The result or the product of these activities is a direct effect of them. For example, on the basis of knowledge about the honesty a man gets such quality as honesty and this honesty is the reason of the fact that he/she is telling the truth. If there are no necessary qualities, then there are no reasons, and if the reasons are not valid, there is no any effect.

Thus, an integral indicator of the effectiveness of the education system is the subjectivity formed in the learning process. At the base of this formation is a process of education, self-learning, and self-knowledge of students. Positive subjectivity is the core product and the main value of education. Final possession of all the core values is carried out in the process of all kinds of self-realization (professional, communicative, family, etc.), in which subjectivity as a quality system is the cause of effects on the

objects (subjects) and interaction with them, causing effects in the form of certain results. Thus, the creation of certain products in various kinds of self-realization is achieved only at the expense of gaining formed subjectivity. The results of self-realization are almost entirely dependent on: a) the level of formation of subjectivity (the qualities); b) the content of spiritual values (positive or negative), which governs its activities.

Based on the foregoing, it can be concluded that the fundamental laws of the system of education and initiative of students have a significant correlation to self-learning, self-knowledge, and self-education. The latter operates on the basis of the following laws: 1) the relationship of self-learning and self-knowledge; 2) the relationship of self-knowledge and self-education; 3) the relationship of self-learning and self-education.

Independent work of students (their self-development), education and self-education system, in our view, play a fundamental role (any activity to be effective, must be based primarily on scientific knowledge); self-knowledge plays a central, integrative role. This is due to the fact that: 1) student connects knowledge of various sciences into a whole (system) only through self-knowledge; 2) the spiritual foundation of any self-realization is a self-project, developed in the process of self-discovery; 3) control of the process of self-realization is carried out only on the basis of self-knowledge (self-reflection); 4) evaluation of self-realization and identification of ways of its further self-improvement is also carried out on the basis of self-knowledge; 5) finally, self-knowledge is the only linking mechanism of the external education and self-education, education and self-learning as well as the linking mechanism of the education system as a whole with all consumers of educational services in the society.

As for the self-education, it plays a decisive role, since all knowledge used in the work, becomes effective only through the education of the individual qualities such as spirituality, skill, commitment, confidence, responsibility, etc. Education is the immediate cause of all kinds of self-realization, which determines their success.

The above statements, in my opinion, lead to a discovery in pedagogical science and enormously enhance the potential of the



development of education. It should be recognized that in present day education no one implements either self-knowledge or self-education of students. These are two gaps or «black holes» of education.

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## **VISUALIZATION OF KNOWLEDGE AS A METHOD OF IMPROVING THE EFFECTIVENESS OF TEACHING STUDENTS**

The introduction of information technologies is associated with qualitative increase pedagogical skills of teachers. In particular, this process is determined by imaging and trends of educational material, as the most appropriate and effective in the perception, processing and memorizing.

It is known, that teachers have a wide variety of teachers professional tasks. Let us highlight the most important, in our view, that teachers integrate the various levels of education and subject areas in terms of innovation, "a minimum of time - maximum information":

- the formation of the fundamental core of general education and a meta-purpose complex learning actions under the new GEF [5];

- conducting educational activities continuously expand and update the information flow in terms of development of advanced technologies and new techniques.

In this connection it requires special methodological tools of the modern educational process allowing teachers and students quickly master the different 'languages' for the development and

processing of scientific information in a fun, accessible way. One solution is seen as the development of a methodology for graphical visualization of information, i. e. transformation of scientific or educational text in visual appearance, the most convenient for visual perception.

This representation allows optimizing the information, organizing the information volumes, making clear and accessible scientific and educational text, regardless of the contingent of the audience or a specific area of knowledge [1].

Anyone has several kinds of memory: visual, auditory, and simple mechanical memory. Visual images are stored in humans faster and stored in memory longer. Therefore, for the training of students, it is appropriate to make full use of these features of the human body along with other properties of memory.

The modern stage of development of science and education is characterized by intensive search of easy to use, compact didactic visualization of various objects of reality that are necessary to support the learning and cognitive activity (pictures, symbols, diagrams, graphs, reference signals, tables, matrices, frames, models and et al.). The appeal to the phenomenon of visualization in education is characterized by transition from the partially intuitive drawing didactic clarity to the design and didactic design, visual learning cognitive-reflective type [3].

Each of the types of visibility presented today in the pedagogical arsenal should have their place and fulfill their role in addressing educational challenges. But, to become regulative in the organization of training equipment must be of such a visual-conceptual properties as systematic, structured, connectivity and pithiness. For the representation of a particular content requires correlation with the level of preparedness of the means of the subject activity, the complexity of the teaching task and the properties of visual didactic tools, since differentiation of pedagogical learning environment determines the choice of means. Therefore, there is no simple answer what visibility is more productive: subject-real, exemplary or sign coding (word, numbers, symbols).

For example, if you want to update the experience of students, it is advisable to use the visibility of the first level

(objective material); development of abstract thinking and language skills of formalization allows to work at the level of abstract values (formula, sign systems), expresses a universal relationship (values in mathematics); if a lot of experience and a wealth of schematization associative array, you must use cognitive visualization tools of a higher level (schemes, frames, models). At each stage of the study of object, the treatment of subjects of educational activities for imaginative interpretation of the studied object is useful and necessary, but not "instead of" scientific knowledge, but on the principle of subsidiarity - to strengthen its processes, emotional, sensory experience, and to evaluate the subject matter from different perspectives.

The term "visualization" is derived from the Latin *visualis* - perceived visually intuitive. Information visualization - numerical and textual presentation of information in the form of charts, diagrams, block diagrams, tables, maps, etc. However, such an understanding of how to visualize the monitoring process involves minimal mental and cognitive activity of students, and the visual didactic tools operate only illustrative function. Another definition of visualization is given in well-known pedagogical concepts (the theory of schemes – R. S. Anderson, F. Bartlett, the theory of frames - Part Volker M. Minsky et al.), where this phenomenon is interpreted as the imposition of a process of internal cognitive activity plan externally mental images, which spontaneously form determined by the mechanism of associative projections [3].

Similarly, Verbitsky A. A. understands the concept of visualization: "Process visualization - a reduction of mental content in the visual image; being perceived, the image can be deployed and provide adequate support thinking and action "[2]. This definition allows diluting the concept of "visual", "visual aids" from the concepts of "visual", "visual aids".

In the pedagogical value the concept of "visual" is always based on the demonstration of specific objects, processes, events, presentation of the finished image, given the outside, not born, and carried out of the internal plan of human activity. The process of unfolding mental images and the "imposition" of its internal plan of the external plan is a projection of a mental image. The projection is embedded in the processes of interaction between

subjects and objects of the material world, it is based on the mechanisms of thinking, covers various levels of reflection and display, manifested in various forms of educational activity [3].

If we purposefully consider productive cognitive activity as a process of interaction between the external and internal plans, as the imposition of future products activities of the internal plan of the external, as the adjustment and implementation of externally designs, the visualization serves as the main mechanism for dialogue external and internal activity plans . Therefore, depending on the properties of visual didactic, affects the level of activation of the mental and cognitive activity of students.

Visualization is a complex psychological process that influences the development of visual memory, the associative, imaginative and logical thinking of students. It is no secret that the student forgets what he heard in class by 90%, what I saw - by 60% and that done by yourself - just 10%. Increasing the efficiency of employment should be sought in a reasonable combination of teaching methods and ways of conveying information. Adequate visualization must first convince the student may intuitively, the truth of certain statements. Visualization should be particularly useful at the stage of formation of concepts.

Due to the phenomenon of visualization has long been known, the various manifestations of this phenomenon indicate the existence and development of the third signal system abstractly human visual presentation of information. The purposeful design of visual aids with different properties and functions performed allows you to design and use them to solve the set of pedagogical tasks [4].

In modern conditions, the traditional and most common and affordable means of visualizing material performances of teachers remain blackboard and chalk, as well as posters typographical or homemade production. This is not only a low level of material security institutions, but also traditions, and even conservative teachers. It mainly relates to the teachers of the old school, which do not use modern display equipment in the learning process.

One of the key tasks of the teacher: the ability to specify, clarify and simplify complex totality. This art is meant when we speak of visualization techniques.

Visualization method means that the teacher, together with the student, makes theoretical, abstract, inaccurate and semantic threads together into understandable that support the professional development of students.

The necessity of visualization can be justified by the fact that training and real work life situations still often occur separately. The studies found that the effect of the transfer learning, or "transfer" is often weak. The concept of "transfer" means the application of knowledge and skills in different contexts. If a university education takes place separately from the actual situations of life, learning can be inefficient, and it does not form a complete set of skills needed in working life. Carefully prepared visibility may enhance the effect of "transfer" of learning. We need to develop a learning environment and ways of learning, so that they were as close as possible to real situations working life.

Knowledge visualization method - an element of pedagogical skills of the teacher, which aims, inter alia, for the following purposes:

- Deepen the essence of the student issue;
- Specify the learner question;
- Focus on the essential;
- To help students remember what you need to remember.

In the practice of teaching it is recommended to highlight several areas of visualization training material, which are examples of organizing learning activities of students:

- Presentation of a new educational material as illustrations, pictorial representation, in the form of charts, tables, models, etc. ;
- Fixation of this lesson teaching material in the form of the information model;
- The preparation of students to preserve their intellectual property means by independent creative activity on the acquisition of knowledge by means of computer graphics;
- Interpretation of the educational information in accordance with the terms of the plan and lectures or practice.

The implementation of these ideas in life is to serve the improvement of the educational process, improve the quality of training. Only with the acquisition of work experience information culture and attitude to information obtained, the ratio of the value

of information visualization in learning and, consequently, the effectiveness of student learning increase.

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**THE CONSTRUCTION TECHNOLOGY OF  
EDUCATIONAL PROCESS AND ALTERNATIVE BASIS  
FOR THE FORMATION OF INNOVATIVE COMPETENCE  
OF THE UNIVERSITY STUDENTS**

One of the urgent problems of modern society is the transition to innovative development. Innovation processes in science, industry, business, in turn, necessitate changes in the quality of professional work of modern specialists, requiring them not only a high level of professional competence, but also the willingness to innovate, to the development of innovations. Thus, the efficiency of innovative development of the country is largely determined by training, ready for innovation, able to develop and implement innovative projects, manage the innovation process.

In modern pedagogical literature innovative processes in education, and particularly in high school, has received considerable attention (Z. A. Abasov, I. V. Batishcheva, E. N. Vasilyeva, V. T. Volov, M. V. Volynkina, V. I. Zagvyazinsky, B. C. Ivanov, T. M. Ivanova, B. C. Lazarev, B. P. Martirosyan, V. Polonsky, V. I. Slobodchikov, K. Sumnitelny, I. L. Torgunskaya, A. V. Chutorskoy, V. A. Shukshunov, N. R. Yusufbekova et al.). In general, pedagogical innovations aimed at improving the educational process, its modernization, improving the quality of education and bringing it into line with contemporary needs of social development. And in this aspect, one of the urgent tasks of innovative education is the formation of an innovative orientation of students [1].

Modern labor market conducts a rigorous selection adjusting formally free professional choice under the influence of competition and economic relevance. The employer evaluates not only the level of qualification obtained, but also the ability to use that experience to acquire new competencies in the mode of self-

development. In these conditions significantly increases the role of the competence approach to training specialist [2]. Under the leadership of V. D. Shadrikov who developed "Model of higher professional education", in accordance with which the modern person must, in particular, be able to translate the knowledge obtained in innovative technologies, transforming new knowledge into concrete proposals [3]. Strategic Development Department of the Ministry of Education and Science of the Russian Federation proposed to discuss the draft Concept of development of research and innovation activities in the Russian universities. In the project's development the priorities for the technological modernization of the Russian economy are stated - training with new competences, forming sources of innovative ideas and technologies in higher education, the development of innovative business with a high school science and the close cooperation of universities with the real sector of the economy [1].

Creating and developing innovative competence is possible in several ways and forms. The formation of innovative competences of students is contributed by: the successful development of basic and advanced training programs (including certification); participation in research activities; acquisition of experience in real projects; participate in contests and competitions. One of the most effective forms is attracting young people into concrete practice of creating and promoting innovative projects. It contributes to the development and formation of innovative outlook and high school youth to develop their competencies in the field of innovation.

The project activity involves the development of innovative competencies through engaging students, bachelors, masters, PhD students and young researchers to the practice of a group project to work on science-intensive projects. We have accumulated some experience in developing innovative projects related to the development of new technological solutions for the processes of industrial wastewater. Students, masters and PhD students made use of various projects, including alternative coagulants and their combinations for wastewater treatment, chemically modified peat for wastewater containing heavy metals and organic compounds.



The presented project activities will enhance the innovative activity of youth to form their holistic view of the content and mechanisms of the innovation cycle and practice to master the implementation of innovative projects.

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## **SUBJECTIVE-ACTIVITY APPROACH TO PERSONAL DEVELOPMENT AND SOCIAL ADAPTATION OF STUDENTS**

Today, the social situation, including on a global scale, is very changeable and dynamic. It is defined by breaking of stable structures in economy and social and political life, sudden wealth differentiation of the population, real problems with unemployment. All that requires from a person to have a competence, to be active in his or her field, to see close and long-

term prospects of his or her activity. At this approach, the inner structure of a person's psychology is necessarily being formed, through the acquisition of the structures of external social activity, i.e. interiorization. In activity theory, the interiorization is a transfer of the corresponding actions referring to the external actions, into mental, inner plan [5, p.210].

Teaching “Social psychology” at the university shows that a great impact on the development of thinking of the students, as subjects, is being made through the process of problems solving, preparing and defending of projects, which are giving the base to a cognitive - emotional education.

Subjectivity of a person, including students, constantly faces social restrictions and regulations, the relativity of which can be coherent only in case of a sufficient development of intellectual functions. The structure of the personal disposition plays here a substantial role as well, because the modus of wellbeing depends on the quality content of axiological complexes and that quality content, which, acquiring significance during socialization process, becomes its determinant.

The most important for a subject is an achievement of the goals in the significative spheres, i.e. manifestation and realization of a person's creativity. From a position of a social psychology, one of the significative spheres is the intercommunication and the interaction of the people.

In interactions with other people, in small and large social groups, personal social behavior may have an implicit as well as explicit character. Any person can practice psycho-correction by himself to a certain extent, i.e. to build his or her personal social behavior according to the scheme: “What is now?”, “What may happen?”, “How it changes in case it happens”, “How to solve?”, “Why is it me who should do this?”, etc. Such subjective – activity approach in our study shows that in such situations some universal technologies of regulation are worked out in a person, and to a greater extent they are oriented to individual capabilities of a person and his or her subjective wellbeing.

In the research works of R.M. Shamionov, M. Argyle, V.V. Gristchenko the concept of subjective personal wellbeing is regarded as an integral social-psychological formation, which

includes self-assessment and the attitude of a person towards him- or herself and his or her life and bears an active principle in it [1, p.215].

In our study, we have analyzed social-psychological dominants of a personal wellbeing, focusing upon an active principle (as an internal component) and an external component (students' studies) when studying the humanities: Psychology, Social Psychology, Introduction into Intercommunication, Culturology, Psychology and Pedagogics of a Higher Education and other.

The study of any university discipline, acquisition of its contents, the knowledge of the historic experience of the people, as noted by A. N. Leontiev, "this is not only a transfer of the information to a student, but a transfer within the process of his or her own activity, which has an active principle and self-perception as an active specificity of actions, which represents a goal-directed, that is motivated, process..." [3, p.155].

The active principle and the organizational and methodological work within the academic activity (an external component) are in a certain correlation and provide subjective wellbeing. Their modi have quasiconstancy in social adaptation, but their directions diverge due to the facts that activity is an attribute of a personality, when teaching and methodological work with its integrated forms is a pedagogical process targeted at the transformative activity. We consider the transformative activity as a special and maximum effective psychological self-provision: on the one hand, this is the knowledge received through thinking, on the other hand – axiological guidelines formed via experience, which mobilize the efforts for the action, not as a single act of activity, but to the perceptual actions.

The perceptual actions are structural units of a process of perception and provide conscious distinguishing of a certain aspect in a perceptibly specified situation, also the transformation of the perceptual data, and leading to the construction of an image adequate to the objective world and the aims of the activity [5, p.114].

We believe that the use of different forms and methods of teaching, innovative pedagogical technologies allows to govern the

process of the perceptual actions' forming within the professional training and social adaptation of the students of the university. In teaching of the discipline, the variety of forms and methods creates a certain algorithm of management of the teacher's activity on managing the learning, in the result of which a student not only acquires the knowledge, skills and know-how, but also develops his or her personal properties. [4, p.260].

One of the effective means of pedagogical management is the application of the role games during classes, with the use of up to date audiovisual technologies, including internet-technologies. At such role games, during the classes on social psychology, a participant presenting any role (of a reporter, a political scientist, a TV-presenter, a press photographer, a representative of some social group and so on) must solve certain tasks, that is to take a corresponding decision and make a correct choice. In any case, he or she has a possibility to express his or her opinion regarding the event as well as his or her opinion towards behavior of other participants.

While studying "Psychological characteristics of the collective activity" using the example of study of small groups as dominants in the society, the students usually have the following questions: "How is a small group formed?", "How are the roles (functions) distributed among the members of the group?", "How does the leader of the group appear?". We present video, which corresponds to the questions above, and ask students to name, for example, the main features of a leader, the reasons why the group could break apart, to determine the collective and non-collective subjects, to choose bright personal traits and to determine the psychological state of the members of the group. During seminars of this type, the activity of students is almost 100%. Not less than 80% of students express their opinion and, as a rule, most of them give the correct appraisal to the events under review. In case of disagreement and different appraisals, there is an active discussion, skillfully managed by a teacher.

Such approach to the teaching of the social psychology and other disciplines, in the research works of L. N. Yakovenko, is considered as a non-standard approach, which is defined by the particularities of the level of aspiration and self-appraisal of a

personality, it is the realization of potentialities, formation of the innovative consciousness, which is bound up inseparably with innovative behavior and subjective wellbeing of a person. [2, p.171].

Finally, it is necessary to admit that the conclusions, at which we arrived in our article, show the significance of correlation between the inner and the external, the individual and the innovative, the subjective and the objective, which provide the formation of the wellbeing among the students, based on human experience, a small one so far but already appropriated. Together with that, an obligatory condition of a personality development and social adaptation of the students in an educational institution is an integrative approach in combination of the subjective-activity, the communicative and the social as the categorical - axiological manifestation.

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## **SECTION XI. Psychological science**

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### **THE POSSIBILITY TO SUPPRESS THE EFFECT OF ONE PERSONALITY AND THE IMPACT ON THE FOLLOWING DEVELOPMENT OF ANOTHER PERSON**

#### *Annotation*

This article discusses the possibility of the influence of one person on the formation of other different methods, the significance of this interaction and the ways of its manifestations. The article also partly discusses the methods of self-examination with the possible existence of a similar situation.

This article is the actual resource to explain the significance of one of the parties of identity formation in view of the highly active in all aspects of life of a single person - and often also due to the inability to pay due attention to the mental and psychological side. The aim of this paper is to illustrate the transformation process of any slightest part of the individual through action specifically addresses the external factor - namely the other person. The subject of the investigation in this case is considered as a separate personality and, most importantly, its changes under the influence of random elements of the environment. This study is possible in the area of personal behavior, overlaps with the type of interpersonal relationship with elements of psychodynamic explanations of the type of individual behavior i. e. the ways of explaining human behavior based on the prerequisites for the formation of his inner world.

The methods of the research on this topic were the analysis and monitoring, development and elimination of the causes of a particular outcome. Process studies on the topic are as follows. The analysis takes place on the example of two personalities - alpha,

which will serve as acting (in this study) and beta, which is the primary and which is recommended eyes perceive posed model.

It is important to note that the influence of psychological herein refers to the impact of not intentional, not originally aimed at beta personality, and in any case it is not violent. It should be understood that the addition of the personality and characteristics of its nature essentially determine the degree of possibility to influence and effect.

Thus, when the simulated situations where alpha and beta identity may be some interaction at the beta-identity may be some diffusion of responsibility. That is under the influence of certain factors, those are: charisma, charm, the authoritative behavior, attractive and available in a beta personality traits, certain gestures that can occupy in the perception of the individual beta special, perhaps even anxious place - personality as if unconsciously may disclaim responsibility for their own behavior. In turn, this behavior will be similar to the behavior of the alpha personality. Many researchers use the term "diffusion of responsibility" on the behavior of the crowd, but in this analysis, the term interest only on the part of the unconscious mental assimilation of certain features of the alpha personality, randomly selected according to the individual characteristics of perception.

Further, there may be a phenomenon called the phenomenon of decrease of intelligence. It is assumed that a similar set of circumstances is not acceptable in all cases. However, it should highlight the distinctive and colorful feature of this observation - namely, the ability to make decisions can wear blunt character. This behavior is explained as follows: beta person can try to look at the specific situation is not through his prism, and the prism of the alpha personality. Precisely, it could be done through specific details.

In fact, it is fair to say that all of the foregoing description is a partial demonstration of depersonalization. Simply, it is the loss of their individual traits, qualities, with the condition of the unconscious replacing them seem necessary or missing.

It is also important to consider possible further depressed state of a beta personality. The causes of this condition are diverse and depend on each person individually. For example, they may

include: beta-identity through introspection and attempts various inferences may conclude insolvency or inferiority of the self.

It is impossible not to note the special role of the individual characteristics of the person, because they combine to create a unique prism of perception through which man sets every detail in the world around separately tuned place and significance.

Since the person is able to adopt favorite features actually force for itself, plant them in during their formation, then the question arises - Holistic whether this person? Because of external factors (in this case - the other person) is capable of exerting such a strong and having a mental resonance effect. In a sense, it would be appropriate to describe such a person as a person with a sensitive perception. Perhaps, it is a similar kind -if refer to the typology of human interaction with the surrounding social surrounding - Carl Gustav Jung would call and "introverted" (from it. Introvertiert – «turned inside»).

In addition to changes in the inner behavior we are often faced with phenomena that, we believe, are far from psychology and introspection. For example, one person is inspired by the act, colorful life of another person, as a result - all internal change and influence through which his identity has undergone reflection and analysis forces him to change his life. There is an effect on the course of life, and what is important to our problem - the influence on the formation of the personality as a whole.

Summarizing all the above thoughts one can conclude that a person under the influence of certain conditions is capable of changing their own perception of their environment wanting to adopt the traits of a personality influences on it or, on the contrary, the change in itself features mirrored alpha personality.

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## **SECTION XII. Social sciences**

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### **INFORMATION COUNTERACTION OF EXTREMIST AND TERRORIST ACTIVITIES IN THE RUSSIAN FEDERATION AND TATARSTAN: THEORETICAL AND APPLIED ASPECTS**

Extremism and terrorism as extremely negative phenomena in the modern world pose a significant threat to national security and interests, undermine the stability of the political system and the political power, and cause damage to the constitutional order. As the foreign and native experience shows, this can and does lead to restriction of various rights and freedoms, deactivation of guarantees of these rights and freedoms as well as the measures, taken to combat these phenomena, are not always compatible with the norms of law. In this regard, the society and the government faces the task of developing effective system of measures to counter the extremist and terrorist activities.

One of the most important areas to combat extremism and terrorism is information. As the experience of combating these phenomena in the Russian Federation shows, police techniques can only temporarily remove the threat of a terrorist act, but that threat will remain as long as a system of reproduction of the infrastructure of terrorism exists. The major elements of this system are the ideology of terrorism and extremism, its' inspirators, proponents and distribution channels. In connection with this, the urgent task of the society and the state is to develop efficient technologies, methods and techniques of information to counter extremism and terrorism, where, as it will be shown in this article, in many respects, the activities of the scientific community will be contributed.

Nowadays, the most important distribution channel for the ideology of extremism and terrorism is the media (television, radio, magazines, newspapers, the Internet, etc.). Certainly, distribution of any of the information through federal channels or national newspapers is impossible because of the multi-level system of censorship, but the Internet represents a significant opportunity for this. Suffice it to mention the social networks, where dissemination of extremist orientation is possible and individual sites, which could be closed, but they will be created again in the new format, but with the same content. All these facts suggest that there is information confrontation of Russia with propaganda of extremism and terrorism, in the frame of that, extremists and terrorists by actively influencing the information sphere tend to resolve their criminal objectives, to achieve any change through force and engage new supporters.

Despite the presence of the various manifestations of extremist and terrorist activities in the Russian Federation, today an effective organizational and legal system to counter these extremely negative consequences has been built. A large number of legal acts were adopted. We can mention among them such documents as Constitution of the Russian Federation, federal laws On Countering Extremist Activity, Concerning the Combating of Terrorism, Concerning the Police, Concerning bodies of the Federal Security Service of the Russian Federation, Concerning Mass Media, conception of counteraction of extremism in the Russian Federation, Edict of the President of the Russian Federation on inter-departmental commission of counteraction of extremism in the Russian Federation, Edict of the President of the Russian Federation on measures of counteraction of extremism in the Russian Federation, etc. Also the legal system of information to counter extremism and terrorism in the Russian Federation consists of the universally recognized norms and principles of international law, ratified international agreements in the field of the fight against extremism and terrorism.

Organizational foundation of the information counter extremism and terrorism consists of governments of all three levels of the federal bodies of state power, bodies of state power of

subjects of the Russian Federation and local self-government. Information resistance carried out by various government agencies, ministries and departments, where law enforcement and intelligence agencies play the important role. However, the coordination of the activities of the authorities in this area is performed by the National Anti-Terrorism Committee and antiterrorist commission in the Russian Federation. There are also federal operational headquarters and operational headquarters in the Russian Federation. If the scope of the first part is to prevent and minimize, and (or) to eliminate of the consequences of extremism and terrorism, the scope of the second is to fight directly against terrorism.

Thus, for a moment, an effective system to counter terrorism has been created, which includes the sphere of information. This fact is indicated by the following data. According to the National Anti-Terrorist Committee during 2013 in Russia 78 terrorist crimes were prevented, more than 260 criminals and their accomplices were arrested; operational headquarters conducted more than 330 anti-terrorism exercises, where plans of situational responses to various types of terrorist threats had been worked out in practice [1].

Despite the activities of various authorities and increasingly involved in Information counteraction extremism and terrorism civil society, the fight against these phenomena is not over. Nowadays in Russia there are about 150 extremist youth groups totaling 1.5 million. People. Representatives of these groups promote ideas; attract people through all kinds of media, through the preaching of the clergy under the guise of Islam fundamental sense, through informal sectarian schools and in other ways.

Manifestations of extremism and terrorism have affected and such a quiet ethnic and religious region of Russia as the Republic of Tatarstan. In the republic the activity of some extremist and terrorist organizations are marked. They are “Hizb ut-Tahrir al-Islami”, “At-Tikfir Val-Hidzhra”, “Tablig-i-Djamaat”, “Nurdjular”, etc. Representatives from these organizations that promote radical Islam, form troubled situation in some areas of the country. The system of counteraction of extremism and terrorism

from the side of public authorities is effective enough, indeed, but these problems can't be solved in one moment [2, c. 14-15].

In my opinion, the information countering extremist and terrorist activities should be implemented in the following areas. Firstly, we need strong outreach actions of anti-extremist orientation. Secondly, the collection, storage, organize, analyze and evaluate information about the threats of extremist and terrorist acts are necessary. Third, the forecast trends of extremist manifestations and, fourth, the development of suggestions for the timely decisions to neutralize the threat should be done.

Realization of these areas supposes taking a number of measures, such as awareness-raising activities, cooperation with the civil society, training of qualified personnel, cooperation with the media, the security services and law enforcement agencies, monitoring of the information field. Let's consider that in details. Information-agitation activities suggest activities aimed at clarifying the audience the nature and the danger of extremism, the implementation of an effective system of education of citizens in terms of ethnic and religious diversity, and promoting anti-extremist values.

Information-agitation activities could be realized though such media as television, radio, magazines, newspapers, the Internet. This could be the TV and radio programs, information materials and articles in magazines and newspapers, Internet conferences, forums, online broadcast, and others. For example, in the Republic of Tatarstan, there is a number of religious programs, which promote traditional and peaceful Islam and tell the audience about the inadmissibility extremism and terrorism in any form. They are, for example, "Friday Preach" (TC "New Age"), Historical-Orthodox program "Path" (TC "New Age"), "True Religion" (Bulgary radio), "The world of culture" (STRBC "Tatarstan"). At the federal level there is a number of print media that addresses the problems of countering extremist and terrorist activities. Particularly, these are such magazines as "Safety", "The man and the Law", "Religion and Life", "Traditions and Life", "Dar al-Islam", "The Word of Religion", etc. An important area of Information-agitation activities is the publication of printed materials (leaflets, posters, brochures, etc.) aimed at the prevention

of extremist and terrorist activities. Cooperation with civil society in the context of the information counteraction to extremism and terrorism suggests the following. Firstly, it is the involvement in the activities of the Information counter research institutions and NGOs. Secondly, the organization of various types of conferences, seminars, forums, "round tables" on anti-extremist theme involving scientists, experts, analysts, representatives of public organizations. Third, the media popularization of positive experience between local authorities, public associations and religious organizations.

Training of skilled personnel in the field of preventing extremism and terrorism suggests training "propagandists" among members of the media, state and municipal employees. This group of measures also include activities for hands-on training courses for journalists on the correct coverage of extremism and terrorism in the media.

Cooperation of media representatives, law enforcement and intelligence agencies in countering extremist and terrorist activities includes involvement of law enforcement officials as experts, publishing their media interviews. An important activity in the interaction of these bodies is the placement in the media "confidence", "hot lines" phone numbers for citizens' appeals on issues of extremism. In my opinion, the implementation of these two areas will help to provide citizens with the necessary information about the situation in this area and a timely response of the relevant bodies on various kinds of extremism and terrorism.

Monitoring of information field suggests tracking of the situation in this sphere by the various government agencies and departments, involving civil society and the scientific communities.

Despite these directions and measures for the information counteraction of extremism and terrorism, an important role in this system is given to an individual. It seems necessary to involve scientific communities more in this activity. Scientific countering extremism and terrorism, which includes the information sphere suggests action in several directions. Firstly, the development of theoretical and methodological foundations of extremism and terrorism, recommendations for solving practical problems in certain areas of activity in the sphere of struggling with these

injurious to the public phenomena. Secondly, conducting applied research with aimed at their future use in political, legal, organizational and administrative decisions in the field of counteraction extremism and terrorism on different levels. Third, the study of international experience of the struggle with extremism and terrorism, improvement of strategies and systems of measures to counteract these phenomena.

As an example of the scientific counteraction of extremism and terrorism we can show the activities of the Department of conflictology of Kazan (Volga Region) Federal University which has been actively involved in realization of the republican target program on the prevention of terrorism and extremism in the Republic of Tatarstan in 2012 - 2014. Realization of the program of prevention of extremism and terrorism in the Republic of Tatarstan has its origins in 2008, because at this time Republican target program for the prevention of terrorism and extremism for 2009-2011 was approved; and it was developed in 2012-2014. The educational program for the prevention of extremism and terrorism in the Republic of Tatarstan has been prepared jointly by the staff of the Department of conflictology (the author of this article is one of this stuff) of Kazan (Volga Region) Federal University in early 2012 as a part of the development program of Kazan Federal University of the 2010-2019. The main objective of this program is to prepare for the prevention and the prevention of extremist and terrorist activities in the Republic of Tatarstan [3, p. 184]. The program is implemented on the base of mediation, conflict resolution and prevention of extremism CFI. Center staff, faculty chair of of conflictology of, as well as visiting scientists and experts, representatives of power structures, ministries and agencies conduct refresher training of specialists in the field of prevention of extremism and terrorism in the Republic of Tatarstan. The main objective of this program is to prepare for the prevention of extremist and terrorist activities in the Republic of Tatarstan [3, p. 184]. The program is realized on the base of the Center of mediation, conflict resolution and prevention of extremism CFI. Center staff, the faculty of the Department of conflictology, as well as invited scientists and experts, representatives of power structures, ministries and agencies

conduct refresher training of specialists in the field of prevention of extremism and terrorism in the Republic of Tatarstan. Four stages of training of members of the antiterrorist commissions, agitators, propagandists, representatives of political and youth organizations of theoretical and practical skills to counter extremist and terrorist activities have already been held.

Considerable attention in the framework of the program on prevention of terrorism and extremism in the Republic of Tatarstan is paid to the information counteraction. As a result of passed four stages, students generally agreed that such courses are essential, because many people have no idea what to do and how to behave in the event of threats of extremism and terrorism. Also there was emphasized the need for their systematic implementation.

Within the individual modules of the program such issues as organizational and legal foundations of the information counter, weaknesses and gaps in the activity of authorities, public institutions in the prevention of extremism and terrorism, energy and funds raised to counteract these phenomena in the area of information, the role of conciliation, consultation, negotiation, mediation in preventing extremist activities, methods of agitation anti-terrorist activities in the Internet, technology and techniques of propaganda activities in the field of information to counter extremism and terrorism are addressed. As a result four stages, that have already passed, students generally agreed that such courses are essential, as many have no idea what to do and how to behave in the event of threats of extremism and terrorism, and also the need for their systematic implementation was stressed.

Department of Conflictology participates in other activities aimed at the prevention of extremist and terrorist activities. Among them are such as "No to extremism!", "Peace Day", "Conflictologist Day" and others in which students of the Department of Conflictology actively participate. Leading scientists, researchers and experts are invited to give lectures, master classes, workshops, role-playing games, aimed at prevention of extremist and terrorist activities. The purpose of these activities is the prevention of extremism and terrorism, strengthening interethnic and interreligious harmony in the Republic of Tatarstan, the prevention of conflicts in social, ethnic

and religious grounds. These activities are also aimed at understanding of the importance and need to maintain friendly, peaceful relations in the society, commitment to non-violence and to achieve harmony between people, nations and countries, the choice of peaceful, non-violent ways of resolving conflicts.

The importance of prevention and combating such dangerous phenomena as extremism and terrorism is stressed within the teaching of individual conflictological disciplines. Theoretical and applied aspects of these disciplines are aimed at developing students' holistic view of modern terrorism, a system to deal with it within the international community and within Russia, at the ability to monitor and analyze the information aspects of the prevention of terrorism, at mastering the skills of organization and management in the structure of various organizations, public authorities and management in developing and implementing programs of prevention and combating terrorism and extremist activity other violent manifestations, as well as the interaction with the security law enforcement agencies.

An important area of work of the Department of Conflictology on prevention of extremism and terrorism is an independent participation of teachers in intercollegiate, republican, national and international conferences, symposia, round tables, which affect this perspective.

Thus, as the analysis showed, information countering extremist and terrorist activities is an important element in the prevention of these dangerous for the society phenomena. It affects various aspects of society and the different actors to counter extremism and terrorism. Information resistance involves active outreach actions of anti-extremist orientation, collection, accumulation, systematization, analysis and evaluation of information about threats of extremist and terrorist actions, forecast trends of extremist manifestations, as well as the development of proposals for the timely decisions to neutralize threats.

Implementation of these directions in practice will help to create an effective system of public opposition to extremism and terrorism in the information sphere. Considerable assistance in this area can be provided by the scientific community, (as demonstrated



by the example of the Department of Conflictology of the Kazan Federal University) that form the theoretical principles and recommendations for the prevention of extremist terrorist activities and the practical mechanisms for their implementation. As a result, effective activity of the system of information countermeasures to extremism and terrorism will contribute to the security of the person, to the stable and harmonious development of the society and the state.

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## **SECTION XIII. Political science**

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### **VIOLENCE AS A METHOD OF SEIZURE OF POLITICAL POWER**

All the known history of human civilization is riddled with violence, which under the influence of various factors appear in different forms. The current situation in the world has revamped its role in politics and social development.

The system is always riddled with power struggles, and in the framework of the struggle, political violence is often used as a fast and efficient way to capture political power. For this reason, it is necessary to understand the essence of the term "policy" and "violence", and to understand what is meant by political violence.

According to the World Health Organization's "violence" - is the intentional use of physical force or power, or in the form of actual threats against himself, against any person, group of persons or a community, which are the result of bodily injury, death, psychological trauma, developmental disorders or various types of damage [1].

Politics as a science studies the conditions and methods for the implementation of the goals of the state. Politics is the art of adapting to these conditions and the use of these methods for the purposes of the state, in practice [2].

As it may seem from the definitions, their values are different and have nothing in common between them. But historian jacket opened the term political violence follows – it is physical coercion used as a means of imposing the will of the subject with a view to mastering the state power, its use, distribution, protection [4].

State begins to resort to political violence due to the fact that it solves a specific social problem: the conquest and the use of state

power to achieve political domination. In this regard, the political violence of the state - is the use of physical force to prevent the protest behavior of citizens, maintain internal order and peace. [3]

The world history has numerous examples showing the use of violence for political aims.

For example, during the French Revolution, August 10, 1792 the rebels stormed the royal palace, which led to the overthrow of the throne of Louis XVI and the establishment of a republican form of government. A month later, revolutionaries staged massacres of the aristocracy and the clergy to retain power.

Over the long history of our country, there have also been seized power through political violence; the example is the numerous palace coups, civil strife and revolution. They all share one thing - the use for political purposes of the armed forces, murder and terror. Thus, during the October Revolution, the Bolsheviks overthrew the provisional government and seized power in the country by the armed uprising.

Analyzing past events, it is safe to say that violence is different from other methods of seizing power following distinctive characteristics: it has a low creative potential, serves as a means of protection from external threats, neutralize or eliminate political opponents, but cannot substitute the reforms aimed at creating certain social, economic and political structures and relationships.

Thus, political violence – is the most effective, but expensive way of seizing power. Its use is associated with great loss of life and destruction of property, so it is difficult to control. The question arises whether this method is effective from an economic point of view?

In connection with the recent events in Ukraine consideration of the implications of political violence and its impact on the economic condition of this country is appropriate.

The armed conflict in eastern Ukraine continues from mid-April and during this time in the Donbass, according to official data of the UN, has killed more than 1.5 thousand people. According to the human rights mission, every day in eastern Ukraine about 50 people are being killed or injured. [6]

As we know, the relationship between the West and the East of Ukraine is escalated because of the socio-economic factors. It is

well known that the more industrialized East Ukraine plan provides west. Basically, Southeast regions are the regions of Western Ukraine donor, because that is where the major industrial facilities are located.

Because of all political action occurred and contradictions, the use of political violence (Maidan, anti-terrorist operations) Ukrainian economy is showing the strongest decline, moreover, according to some economists, the country may soon happen defaulted. According to the report of the National Bank of Ukraine in the first quarter 2014, the earnings of Ukrainian enterprises increased by 2.2 times, while the losses - as much as 5.5 times. As a result, the deficit was equal to almost 11 billion dollars. Naturally, the flow of investment dropped sharply, and the industry virtually collapsed - in just four months, industrial production fell by 5.3% [6]. In addition, the industry lost their main markets for their products due to the almost complete break Ukrainian trade and economic relations with Russia, as in the years of independence, Ukraine has failed to diversify away from closer economic ties and cooperation with Russia. [5] Currently, Ukraine cannot compensate for such a huge loss.

Thus, a feature of political violence as a phenomenon consists in the use of force and coercion to implement the will power or resistance to it. Without doubt, political violence greatly hinders the development of the state and society in general.

So, the modern era, with its processes of information led to the emergence of new forms of imposing the will. Political violence is gradually gaining covert forms that act on the subconscious mind of individuals. Power modalities begin to fade into the background, are replaced by more efficient, non-traditional means of exposure.

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## **THE POLITICAL MECHANISMS, PARADOXES AND THE ESSENCE OF DEMOCRACY. THE CAUSES AND WAYS OF ITS FORMATION AND ITS PERCEPTION TOWARDS CHANGES IN THE 21ST CENTURY**

### *Annotation*

This article discusses the essence of a democratic mechanism, especially the perception of the concept from different angles. Also, it highlights the paradoxes that arise in the analysis and application of the essence of the foundations of democracy in practice. The peculiarities of perception of democracy in our time, as well as ways and methods to influence change this perception; the nature and impact of different models of democracy - of aggregate and communicative; look at the democratic model as antagonistic to the concept, that means with the possible presence of improving competitiveness.

This article is relevant because of the inability of the international community to properly characterize the essence of the

democratic system, and most importantly - to find effective methods of management, based on democratic foundations. In other words, the presented reasoning and analysis are intended to streamline the ways to solve the problems associated with a distorted understanding of the term "democracy" in all respects. A comparison of the individual is also taken into account the paradoxes: the policy has the power or knowledge? You must also take into account the peculiarities of perception of democracy in the 21st century.

The methodology for the study of this topic is a deep analysis of the different interpretations of the essence of democracy, as well as a comparison of different points of view on this issue. The main one is the ability to put together a compromise judgment regarding the practical application of democratic principles and to bring universal variant proper perception of the democratic model as a whole.

It is necessary to start with the basic concepts of power to delve into the use of democratic power. So, what is the policy - the power or knowledge? After democratic model in the minds of humanity is represented in theory, in fact, as a reasonable and equitable management of knowledge - basic knowledge, which are based on the rise of the citizen primarily as personalities - inviolable. However, in this case the question arises - whether implemented at the harsh practice of meaning, originally founded in the broad term?

After all, you must correctly match democratic management and democratic perception. In other words, our understanding may be more appropriate than to the definition of democracy in relation to a particular person, but "to spray" this knowledge properly on the whole system interactions, it is not always possible. Modern Western society as a whole exists in accordance with the installation, that the question of power and the question of knowledge is not associated with each other. In this case, the objectivity of scientific truth and depth of philosophical thought cannot and should not be defined and directed the political actors - in other words, I entrust to the hands only of political actors.

It is necessary to apply to the etymology of the term democracy (dr.grech. Δημοκρατία- «power of the people», from

δῆμος- «people» and κράτος- «power»). The basic concept, which is based on a democratic regime - especially as the concept of the people - turned limiting abstraction, as it turned out that people in one particular state can be (and is) different. After all, democracy has proved itself as a militarist, and as a pacifist, and as a reaction; absolute or liberal, centralist or decentralizes power.

Back in the 20th century it was seen as the essence of democracy, the focus of which was made in a competitive process and selective refusal to accept democracy as the term "common good." As a result, today we can observe the following transformation: democratic politics was separated from its normative dimension and has been regarded solely with the instrumentalist view.

Further, it is worth to focus on understanding and communicative aggregative models of democracy, because the approach is incredibly important and the method of extracting any democratic ideas and their subsequent use. Aggregate model is a legal mechanism that aims to reach a compromise. Communicative is a having principle conducting adoption through public. In the late 20th century, both of these models were subjected to radical criticism. The reason is that for these models social conflict exception of his visual field is characteristically, as well as an attempt to present society as a non-antagonistic unity. In contrast to these models, the antagonistic model of the 21st century is trying to point out the inevitability of social conflict and the need for its existence. Unfortunately, human nature is not always able to take the rivalry is as an element of political benefits, so this model now exists mostly in theory. It is the negation of the political in an antagonistic aspect prevents liberal theory to understand the roots of violence, and to find the right approach to the choice of the method of policies.

It is important to understand that democracy is not worth putting in a certain framework. For the theory it can be fatal, but tolerable, because somehow democracy is subdivided into a plurality of interpretations, each of which is the presence of a rational grain would be appropriate; But for active practice, exemplified by many modern countries, placing strict frame can be devastating. Even Chantal Mouffe in herr articles repeatedly urged

the international community to recognize the fact that the world is pluralistic, and understand that for a favorable political situation, the best solution would be to take a variety of forms of political organization, but in any case it is not necessary to impose all uniform political model.

Summarizing all the above we can conclude that democracy in its essence cannot be realized by single, uniform way - in this way it can exist only in theory. That is why, for a clear understanding and effective application of the foundations of the democratic model must consider all the features of the area to which this application is directed, and do not put such a broad term as "democracy" in the narrow framework. Maybe find a theoretically coherent definition of democracy, but in any case it will not reflect the completeness of the term, but in practice it is possible to build a model taking into account the individual characteristics of the conditions, partially respond to the range of theoretical statements.

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## **SECTION XIV. Ecology**

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### **THE CURRENT STATE OF LOW WATER OF RESERVOIRS IN RECREATIONAL AREAS OF NATIONAL PARKS UNDER THE CONDITIONS OF ANTHROPOGENIC EUTROPHICATION**

Surface and subsurface waters are among the most important natural recourses of the Russian Federation. The need in supervision of water body is proclaimed with the environmental protection law and some government regulations. According to these documents, observations stations of state ecological monitoring are based in rivers, lakes and reservoirs which are essential for recreation, fishing and potable water supply. The list does not include lots of small rivers and lakes, ponds, brooks and carriers, which are uncontrollably used with recreational and domestic purposes. The monitoring of water quality is significant in cases, when reservoirs are located in the territory of human settlements in recreational zones of specially protected natural areas (SPNR). Frequently, reserved areas and national parks seek research officers in order to monitor all the objects in the territory of their jurisdiction. In such cases it is efficient to unite scientific organizations and scientific offices of SPNR within common researching programs. This way was chosen by National Park Valdajskij and Biology and Ecology Department of St.Petersburg State Academy of Veterinary Medicine, which dedicated researches to small reservoirs of the recreational areas of the park under the conditions of anthropogenic eutrophication.

It is well-know that the evolution of lakes under natural conditions ends up with the shallowing of the reservoir with bottom matter and macrophyte storage, bogging and total disappearance. Natural evolution is durable, although the beginning of closing stages leading to the total disappearance

accelerates under the anthropogenic influence. as a result, changing of natural structure of reservoirs deteriorates their ecological state and brings to impoverishment. It is obvious, that columbine influences small lake much more than big reservoirs which are more flexible ecologically. As a result, under anthropogenic activities, ecosystems of small lakes lose their value as a source of potable water. Degradation or disappearance of small lakes inevitably deteriorates biodiversity of any natural site. It is absolutely intolerable in case when a reservoir is located in specially protected natural areas. The problem is that most of national parks were founded in Russia 20-30 years ago, meanwhile rural settlements, located in SPNR, have existed for several hundred years. A scheme of life has been establishing for centuries and it includes active exploitation of reservoirs within settlements. A ban to use reservoirs may lead to reconstructing a public system, which will need extra expenses. Therefore, on the one hand reservoirs must still be used for recreational and domestic purposes, but on the other hand, it is important to follow protection regime. In order to find an appropriate operating procedure of such reservoirs, it is essential to have a perception about the current state of water on hydrochemical and health criteria.

The purpose of our research was to define the quality of water of small reservoirs within rural settlements on the main hydrochemical, health and microbiological criteria. In 2014 the following reservoirs were taken for the research: Vasilkovo Lake (57°32'8"N 32°56'23"E) and Babekha Lake (57°31'N 32°56'E) located within Polново rural village and related to Polnovskij River Reach of Seliger Lake which belongs to the area of Valdajskij National Park. The reservoirs are constantly used for recreational and domestic aims. The quality of the water has not been monitored. Therefore, on the one hand, both lakes suffer from anthropological influence. On the other hand, the monitored lakes themselves may be the source of danger for the population and domestic animals.

The researches are the part of cooperative exploration program of St. Petersburg State Academy of Veterinary Medicine and Valdajskij National Park. Samples were taken twice in the period of open water in July and August, 2014, from the littoral

and centre of the lakes. The researches were conducted according to standard practice of monitoring water bodies GOST 17.1.3.07-82, GOST 17.1.5.01-80, GOST P 51232-98. Compliance assessment of water quality was conducted according to SanPiN 2.1.5.980-00, GOST P 51232-98, ГИ 2.1.5. 1315-03, SanPiN 2.1.4.1175-02, SanPiN 2.1.4.1074-01, GOST 17.1.2.04-77 [2, 3, 6, 8, 14].

Colour of water is specified with the concentration of iron, water bloom, in rare cases with the excesses of humic matter. In Babekha Lake the colour of water did not exceed 20 degrees, in Vasilkovo Lake this index was even less: 0-10 degrees, which meet regulations.

The organoleptic indicator and clarity of water are also within standards. However, in Babakha Lake clarity is not high, 1.1-1.2 metres; in Vasilkovo Lake clarity is higher (1.6-1.7 metres).

Oxygen content and level of saturation have essential commercial fishing importance. Deterioration of oxygen below an appropriate level causes stress for fish and, as a result of the stress, different deceases. Besides, these factors are important for other phyktioplankton and benthic animals and plants.

According to our research, oxygen content is 7.1-8.4 mg/l in Babaekha Lake, and 8.2-9.6 mg/l in Vasilkovo Lake. Moreover, in Babekha Lake decreasing of oxygen content was from surface to bottom. Often it is a sign of impoverishment. In Vasilkovo Lake oxygen content was almost the same. Degree of oxygen saturation in both lakes is 80.5-89.1%.

Hydrogen ion concentration is extremely important for ecosystems of small lakes. Most fish endure 5-9.6 pH. According to the results of our research, pH is 6.7-7.1, that meets regulations both for water bodies of recreation purposes, and fishery waters.

The high level of ammonium ion concentration can be a sign of the entry of domestic and agricultural effluents, leading to the deterioration of the sanitary state of water reservoir. While making researches of Babekha and Vasilkovo lakes we found out that the ammonium ion concentration is 0.1-0.5 mkg/l and it does not exceed a standard.

Phosphorus concentration is higher in Babekha Lake (2.2-2.6 mg/l). In Vasilkovo Lake this index is 0.5-2.6 mg/l. Thereby the results meet regulations, both for recreational and fishery water bodies.

Iron ion concentration is 0.05-1.16 mg/l in both lakes, and this result exceeds maximum permissible concentration in reservoir water for fishery purposes and it can have a knock-knock effect on a recently started process of bogging.

The main sources of sulfides in reservoirs are the processes of bacterial degradation and biological oxidation of organic substances. Presence of sulfides is inappropriate for reservoirs of sanitary, domestic and fishery usage. In Babekha Lake sulfide concentration is 0.1 mg/l, that can indicate both immoderate anthropogenic impact over the reservoir, and rising process of bogging. This suggestion is confirmed with sanitary microbiological data. Total bacterial count is 1.7-4.81 mln kl/ml in Babekha Lake, 1.82-3.30 mln kl/ml in Vasilkovo Lake. Besides, the number of bacteria is higher in the bottom. Therefore, the waters of Babekha Lake can be characterized as polluted, the waters of Vasilkovo Lake as moderately polluted. Saprophytic bacterial count is 0.63-90 thousand kl/ml in Vasilkovo Lake and 0.67-1.1 thousand kl/ml in Babekha Lake. In both lakes coliforms are found (1-7 cfu/ml in Babekha Lake and 1-4 cfu/ml in Vasilkovo Lake). No doubt, it indicates the water pollution due to household waste.

To sum up, maximum allowable concentration of sulfides and iron ion do not exceed the standards, but sanitary microbiological results are warning. The reservoirs are suitable for recreational purposes, but fishing and withdrawal of water are totally unacceptable. According to results of the research, the reservoirs can be referred to the second cleanliness class. However, even now it is obvious that water protection should be strengthened in the area of both lakes. Later the list of accountable factors should be expanded in order to make the passport of the reservoirs and to give recommendations on their rational usage.

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**2014**