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## THE EMOTIONAL BURNOUT SYNDROME AMONG TEACHERS OF PRESCHOOL EDUCATIONAL INSTITUTIONS

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The article analyzes the problem of emotional burnout of teachers of preschool educational institutions, discusses the models and phases of development of this deformation of the individual; the factors that trigger this process. Presents the results of investigation of emotional burnout of teachers and their sociometric status in the team, the proposed measures for the prevention of the development of this syndrome.

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**Keywords:** teaching activities, emotional burnout syndrome, phase of emotional burnout, depersonalization, mental hygiene and mental prevention of emotional burnout syndrome

The urgency of the problem of mental and emotional health of teachers of preschool educational institutions and its relationship with socio-psychological factors due to the fact that modern society places high demands on various aspects of activity of teachers in General and teachers of preschool educational institutions in particular, institutions that are first, the basic part of the entire education system and serve to prepare the child for further education, bookmark it basic human knowledge and skills, the comprehensive development of natural abilities and exposure to the social life. In the educational activity content and the nature of relations between its members are collateral to its success. It is therefore evident that the emotional burnout syndrome characterized by emotional and personal detachment of the teacher educator, the expanding economy of emotions, ignoring individual characteristics of the pupils, has a relatively strong influence on the nature and success of professional activity.

In most works, the problem of emotional burnout is considered mainly from the point of view of psycho-physiological approach to the study of personality. However, it seems obvious and the fact that the specificity of pedagogical activity in modern conditions due to high risk of developing emotional stress and emotional burnout syndrome under the influence of the subjective and objective, socio-psychological factors of educational environment [4]. In this regard, justified and relevant, due to lack of knowledge, the study of the role that the social-psychological factors in the formation of emotional burnout syndrome among teachers and educators of preschool educational institutions. The most important among them is the sociometric status of a teacher of preschool education institutions, recognition of his personality, professional achievements and contributions to the team.

### The main part

There are various definitions of emotional burnout. In accordance with the most popu-

lar foreign model K.K. Maslach and S. Jackson [5], burnout is viewed as a response to long-term professional stress interpersonal communications and manifests itself in three structural components: emotional exhaustion, depersonalization (cynicism) and reduction of personal achievements.

In the domestic scientific literature the most recognized and confirmed in applied research is the approach to the problem of emotional burnout centuries Boyko [1]. The author gives this definition of burnout (it should be noted that in the vast majority of both domestic and foreign researches on this issue, the concept of "burn-out" and "professional burnout" are treated as synonymous): "Emotional burnout is developed personality a psychological defense mechanism in the form of full or partial exemption of emotions (lowering their energy) in response to repeated traumatic exposure" [1, p. 133]. Boyko is considering the formation of emotional burnout as a dynamic process, influenced by external and internal factors, and which develops in accordance with the mechanism of the development of the three phases of stress: alarm voltage, resistance and exhaustion. According to the model Century Century Boyko, features displays of a syndrome of emotional burnout of teachers of preschool educational institutions can be characterized as follows:

In the phase voltage teacher under the influence of daily accumulated stressful circumstances is aware of the presence of these factors in their professional activity, which leads to increased dissatisfaction with himself, his profession, a sense of hopelessness, despair, anxiety, disappointment in myself, in the teaching profession and in his post. In the phase of resistance, the teacher consciously and unconsciously tries to reduce the influence of external circumstances, while taking inappropriate emotional reactions in professional communication, earning himself and his strategy, thereby further blocks are adequate of the emotion that causes the "savings" of emotions,

which gradually causes a reduction of professional responsibilities, when the teacher simply apportion the attention of children, colleagues, limited to formalized part of business communication. In the phase of emotional exhaustion burnout is transformed into a permanent personality characteristics and behavior of the teacher, causing full or partial loss of interest in the subjects of pedagogical communication to complete depersonalization and leads to a transition reactions emotional level psychosomatic (can lead to various somatic diseases). In severe forms of the phase depletion employment of a person in the sphere of preschool education is contraindicated.

The formation of emotional burnout syndrome among teachers is determined as the total for all communicative professions factors and factors specific to the activity ("low pay, lack of prestige of the profession, the imbalance between intellectual energy costs and the moral and material compensation, permanent press" review by the various services, management and parents, the intensity of the educational process, expressed in the content of the educational programmes, etc.). It should be noted another important socio-psychological feature of the organizational structure of pre-school educational institutions, the homogeneity of the gender of the teaching staff, namely, his feminisierung, therefore, he has a peculiar exclusively female group specificity. According to K.A. Dubinskoy [3], applied to homogeneous teachers gender features "manifest primarily in the increased importance of interpersonal relationships in the context of intergruppo structuring, the desire to avoid conflict, combined with the predominance of passive-aggressive behaviors when they occur, bringing the emotional-affective component in any decision, including a purely business problems, expressed manifestations of the phenomenon of social contagion in the broader situational context. All this significantly complicates the process of group development, and experiencing stress-related professional activities" [3].

The aim of our study was the analysis of the relation between sociometric status of a teacher of preschool institutions and manifestations of emotional burnout syndrome. To implement the objectives of the study, we used the following methods and techniques: testing on the methods of diagnosis of the level of emotional burnout centuries Boyko [1], the method of diagnosing professional (emotional) burnout (MBI) K.K. Maslach and S. Jackson in adapting N.E. Vodopyanova [2], sociometry. Empirical base of the research was, the teachers of kindergarten № 142, Tver. The diagnostic results of these methods were comparable and did not reveal contradictions. By the first

method MBI high level of emotional burnout was detected in 6 employees (20% of the staff), and appeared on the depersonalization factor (43%), i.e. some emotional "dryness", detachment from the subject of professional communication. By the method of V. Boyko, which confirmed a generally positive emotional atmosphere in the team, not conducive to rapid progressive formation of burnout symptoms, also identified isolated cases of formation of phases of burnout, however, does not allow to evaluate the level of statistical significance. We have conducted parametric sociometric study with a statistically valid for the team of 34 members sociometry limitation in the number 7 election. To determine the sociometric status of the teacher were calculated sociometry index for each member of the investigated group, subsequently ranked using the tool "Descriptive statistics" package "data Analysis with Microsoft Excel 7.0 into three groups: "high status", "sredneetazhnye" and "one of low status" teachers. It was found that the sample represented 26% of the high status of teachers, 42% one of low status (mainly beginners team and teachers with great experience) and 32% sredneshirotnykh teachers.

A comparative analysis of the level of emotional burnout of caregivers and teachers, occupying high status, sredneetazhnye and one of low status position in the group was conducted on the basis of the average intensity of each of the three phases of burnout by the method of V.V. Boyko. Average values of burnout in two phases – voltage and resistance above it sredneshirotnykh employees, the depletion phase lead with a small margin (1 point) one of low status employees. High status employees identify low levels of burnout in all three phases. You should pay attention to the fact that when comparing quantitative criteria for determining the level of emotional burnout by the method of V. Boyko (36 or less points – phase is not formed; 37–60 points phase at a formative stage; 61 or more points – formed phase) and the average burnout in all three status groups, none of the three phases of emotional burnout is not detected formed or forming. Moreover, the most pronounced, from the point of view of professional burnout, phase – phase resistance, the higher the level of its average value (sredneshirotnykh employees) when there are only 30 points, which is significantly below the established centuries Boyko threshold for the beginning of the formation of phases in 36 points. The low degree of burnout among teachers of the studied preschool is confirmed also by external observation and analysis of the performance of the team. As an example you can take a group of teachers, with enthusiasm and emotional involvement involved

in the preparation and support of colleagues of the teacher-psychologist – in competition “the Best teacher”, which resulted in the first place first in the city, and then at the regional level. Or, for example, participation in the traditional launch balloons into the sky graduates of the preparatory group, which caused a noticeable positive emotional response from teachers.

### Conclusion

Thus, the results of our study in General convincingly prove the influence of socio-psychological factors on the formation of a syndrome of emotional burnout of teachers of preschool educational institutions, namely confirmed that favorable intergroup climate, which is manifested in sociometry positions of group members, and relaxed emotional conditions prevent the formation of emotional burnout. Because the structure of informal relations interpersonal significance may mediate mental health of teachers in General and the degree of manifestation of emotional burnout in particular, and ultimately the effectiveness of educational activities, the optimization of the relationship in the pedagogical team and ensuring a favorable psychological atmosphere in the group can be considered the most important directions in psychological prevention and mental hygiene work of teach-

ers of preschool educational institutions. For the purposes of psychological prevention and psycho-correction of the emotional burnout syndrome can to recommend the following: first, to optimize the workload of teachers, to establish in preschool rooms or “corners” of psychological relief, to schedule the work of the teachers involved in the training of cognitive and behavioral skills training for coping (overcoming) emotional stress influences the development of emotional self-regulation skills with the help of a psychologist, to arrange psychological training to optimize the socio-psychological climate in preschool, formation of corporate culture in the team.

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## PECULIARITIES OF LEARNERS AUTONOMOUS WORK ORGANIZATION AT FOREIGN LANGUAGE CLASSES

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The article focuses on some problems of organizing independent learners' work and developing their thinking ability in a foreign language classroom. On the basis of theoretical analysis of the literature on the problem under research, authors of the article suggest possible ways of developing pupils' independent work. Specific ways of techniques use in organizing autonomous learners' work are revealed in the given article.

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**Keywords:** independence, autonomous work, process of learning, cognitive autonomy, self-assessment, individual independent work, project, problem solving activities, harmonious personality

Fundamental requirement of a society to the modern school is the development of a personality, capable to solve his educational scientific, industrial, public objectives; think critically and defend own views, beliefs, systematically and continuously expand and update knowledge through self-education and creatively apply it in practice.

One of the most affordable, ways to improve the quality of knowledge of students in the classroom is the organization of learners' independent work.

Organization of independent work, its management is a responsible and hard task of every teacher. Cognitive activity and independence is considered as a part of the education of students. This problem is a task of paramount importance. Speaking about students' independent work, it is necessary to bear in mind two closely related tasks. The first of which is to develop students' independence in cognitive activity, teach them to acquire knowledge on their own, shape their worldview; the second one is to develop skills of application of their knowledge in practice. Independent work is not a goal in itself. It is a means of ensuring a deep and solid knowledge of students, a means of shaping their activity and independence as a personal quality, the development of their mental abilities. The child is unable to plan his actions from the very beginning of his school life, to correlate the result he achieved with the intended aims. The success of the training depends essentially on the conditions which the teacher creates for active and independent cognitive activity of students. Therefore, an innovative environment should be created for learners that would provide their cognitive activity and realization of their creative potential, involving self-improvement and systematic application of knowledge in life situations.

Progressive educators always believed that at the lesson children should work as much as possible on their own and the teacher's duty is

to guide this work, insuring the training material. [1] For developing an integrated and harmonious personality, a pupil should be involved in autonomous work of problem solving-character. There are many different directions in the study of the nature of the activity and independence of pupils in learning. Ancient scholars (Aristos, Socrates, Plato, Aristotle), deeply and thoroughly substantiated the importance of voluntary and independent child's mastery of knowledge. They considered that such activity gives the child the joy and satisfaction and thereby eliminates the passivity on his part in the acquisition of new knowledge. The problem was further developed in the statements of Francois Rabelais, Michel Montaigne, Thomas More, who at the time of the Dark Ages, in the midst of prosperity in the practice of scholastic school dogmatism and cramming required developing a child's self-reliance; cultivating in him a thoughtful, critically thinking person.

An interesting study conducted the representative of the Estonian Research School I.E. Unt. She considers that an independent work is a mental activity of learners, "when the student is given the training tasks and a teacher is a guide for work implementation is carried out by a teacher, but without his participation". I.E. Unt believes that the content and structure of the material defines the quality of independent work. Indeed, the content of the material affects the methods of the academic work, so they must correspond the studied material [2]. M.A. Danilov considers that main criterion for independent work is the solution by students of cognitive tasks and problem solving situations. The challenge, – he said-encourages students to work independently, serves as the initial point of their thinking process. Students seek out new ways to solve them through the acquisition of new knowledge and deepening of old. Success depends on the organization of independent activity which includes the proper distribution of time on some stages, a clear setting of the task to students [3].

P.I. Pidkasisty, who also studied the problem, said that the essence of independent work should reflect student's creativity and integration of the procedural and logical-content part of an independent work. In Pidkasisty opinion, they are not sufficiently taken into account in educational practice, cursing boring and monotonous activity of the student. He believes that the independent work in each situation is defined by the assimilation of specific goals and objectives. One cannot but agree with P.I. Pidkasisty, that self-study is essential for self-organization and self-discipline in mastery of the techniques of cognitive activity, it produces a learner's mental attitude to self-updating knowledge and develops skills to navigate the different flow of information for solution of different problems. In A.I. Zimnaya's opinion, independent work is characterized "as a purposeful, self-motivated, structured work; performed and corrected by the learner according to the results, having got by him".

Analyzing all the possible approaches to the definition of the concept, the following definition could be given: "Independent work is a kind of learning activity in which students with a certain degree of autonomy and, if necessary, with partial teacher guide perform various kinds of tasks, applying the necessary mental effort and showing the skills of self-control and self-correction".

The use of modern and innovative teaching methods is the basis for the organization of independent work of students in the classroom. Problem solving approach is considered to be one of such methods [4]. It is based on the theoretical position of the American psychologist and educator John Dewey. At the present time the problem solving approach refers to a method of organization of lessons, which involves the creation of teacher guided problem solving situations and active independent work of students on their solution, as a result of which creative mastery of the knowledge by students and development of their thinking skills take place. The specific feature of problem solving technology is the fact that the knowledge and ways of work are not presented in a ready way; rules and regulations are not proposed, following which, students could speak in a proper way. The essence of the method is stimulation of students' search activity. Such an approach is caused by the orientation of modern education on formation of the creative individual, developed through problem solving situations. Enhancement of the cognitive work of students, the development of their interest to the subject; the formation of independent, creative attitude to the studied problem succeeds, if the teacher constantly thinks, involving students in an active process of argumentation, sup-

ports their own view point, when the proposed tasks require search activity. Problem solving approach is based on the creation of a special kind of motivation, therefore requires an adequate construction of the didactic content of the presented material as a series of problem solving situation. The source of the internal stimuli of independent cognitive activity in this case is intensification of students' actions, caused by setting of problem solving tasks and rational organization of independent work. Such tasks develop the students' desire for self-cognitive activity. It should be noted that this method, despite its effectiveness like any other, cannot be considered the only acceptable one for training, since the effectiveness of training depends on the skilful combination of different methods. Teachers should remember that not every ordinary question could be regarded as a solution of the problem. Too challenging assignments cannot be given for to the students, as they require special training and knowledge. Problem-solving based learning suggests solution of feasible tasks by students, which create opportunities for their own discovery.

The important point is summarizing of the issues discussed. The teacher can use different ways of encouraging students. Also, the teacher needs to show tolerance to errors of pupils and correct them when the student needs help. As it was noted above, the problem solving method corresponds to the social requirements, developmental nature of scientific knowledge, the basic laws of the development of personality. The use of a problem-solving approach in teaching and learning process promotes development of the students independent work skills and solution of problems, set by them.

Improvement of skills of independent work of students at foreign language lessons can also take the form of individualized learning, called Dalton Plan [5]. This system is also known as the laboratory or workshop system, since instead of classes, the school laboratory and subject workshops function. The main goal of this form of training is adapting the work of the school to the capabilities and abilities of each student. In the laboratory the students work individually according to the tasks, given from the teacher. The tasks in each subject are given for a whole year. Then they are specified monthly, students within a month are to perform these tasks and report on them. If there occur difficulties, the student could ask a teacher for help. Group work is performed for 1 hour per day. The rest of the time students individually study material and account the teacher for the performance of corresponding topic. On the bases of such form of the work many effective methods of educational activity were created. For example, to stimulate the students and

enable them to compare their achievements with the achievements of their peers, teachers developed special tables (screen performances), in which monthly the progress of the students of their assignments were noted. One of the main components of the Dalton Plan is a task. Deadline for the task can be different – from several days to several months. Making various Dalton-tasks, a teacher faces the problem of multiple meanings of words that can occur in the text. Therefore, before performing tasks, all problems should be discussed. Tasks should be based on the real experience of students and contain conditions that expand students language experience. As any other method, it has a number of positive sides:

- Individualization of the learning process;
- The development of ways for choice;
- Improvement of the ability to work independently with all kinds of literature;
- Development of cooperation skills and one's own ideas.

Dalton plan is an effective means of organization of students' independent work at foreign language classes.

The project work is another method of improvement of students' independent work. Method of projects occurred when the minds of educators, philosophers were focused on trying to find ways to develop active, independent thinking of the child, teach him not only memorizing and reproducing knowledge that will give him the school, but to be able to apply them in practice [6]. The method of projects has been widely used in many countries, mainly because it allowed to integrate students' knowledge from different fields to solve one problem, made it possible to apply this knowledge in practice, thereby generating new ideas. But let us turn to a foreign language. The project is valuable only, when in the course of its implementation, students learn to work independently, gain experience of cognitive activity. This method helps improve the learning process in ordinary schools, develop skills of independent work of students.

Project-based learning involves the use of a wide range of problem-solving, research, exploratory activities, focused on clear results, relevant to each student who participated in the development of the project. One must remember that at every stage of the lesson the teacher should initiate an independent search, creative activity of a student, guide students to identify problems that form the basis of the project and find ways to solve it.

At first, the teacher needs to develop a plan for project work and think over a system of communicative exercises [7]. Students must be fluent in the use of active vocabulary and grammar within the framework of an educa-

tional theme before discussion of certain issues. Work on the project usually takes a few lessons. Organizing work on the project, it is important to meet following requirements:

- Correspondence of the project theme to the lesson theme;

- Students need to focus on the comparison of events; facts from the life of people of different nationalities and countries, approaches to solutions various problems.

Pupils should be able to generalize reading material, make their own conclusions, based on their experience, knowledge and creativity. They should be able to analyze the studied material, compare different facts, predict the course of the project defense. Method of projects in the framework of the foreign language educational process focuses on practical results that are meaningful for students. Their educational horizon is expanded, cognitive interest is increased; they become natural participants in the dialogue of cultures. Pupils have the opportunity to show their organizational talents and ability to independent acquire of knowledge, which is very essential for the organization of the teaching and learning process in the modern school.

One of exercises, developing the students' initiative speech is the story telling, based on pictures with non-deployed complicated situation (essential in this case is not a picture, but "internal" visibility, own speculation, fantasy, and the language capabilities of each student). For example, the teacher shows a picture, which depicts three students sitting in a cinema chair. Exercise can be performed within the following framework:

- a) a story on behalf of one of the guys in the picture;
- b) a story on the part of the third person;
- c) a story in a chain;
- g) a story of a teacher for getting additional information.

Thus, while introducing students new language material, it is important gradually to complicate it by "creative" tasks-it develops students' speech. The use of different materials in the work, including into the cognitive process different audiovisual supports, keys, educational games, the creation of communicative self-oriented situations, which stimulate independent work of pupils, support interest for learning a foreign language.

Special difficulties cause students' independent reading work. Therefore, much attention must be given in 5–6 grades to a culture of academic learning work, focused on planning of independent work of students, wide use of cards for reading; individual work with students.

Cognitive opportunities for independent student work will be increased if the students'

work is organized according to the principle of contact groups, which include students of various educational opportunities, but the same interests. This group performs the same task, which is distributed among students in accordance with their interests and language capabilities. For example, when studying the topic "My Country" (Grade 7) students, who are interested in history, prepare their own monologue about its past; those, who are interested in art – its sights; those, who are interested in sports, tell about sports its inhabitants are fond of. The work is coordinated by the student, working as an Assistant teacher. In the organization of learning activities for students pair and group forms of work are used. For the organization of group work, it is necessary to prepare a special card with tasks that allow all members of class to be involved in active communicative work and effectively manage the work of the whole class.

One and the same dialog can be presented in different ways. If learners are accustomed to creativity and fantasy, they think over numerous original versions. Further work on this dialogue can be continued. The task may be: broaden the dialogue, adding five or six remarks, depending on the situation.

In high school, while performing creative exercises, it is important for pupils to use the real facts from school life, class; express their attitude, opinion on a particular issue. Use of the speech situation in the classroom can serve different goals in teaching and learning process: develop skills of dialogical and monological speech, promote the assimilation of lexical and grammatical material, serve as a means of testing reading comprehension, etc. Offering a communicative situation, a teacher should take into account the language skills of students, think over the problem of organization of weak students work. For example: in the 6th grade, when working on theme "My home" the following situation may be offered: "You have a new flat. Help your father and mother arrange all the furniture in the living-room". For weak students teacher prepares cards with the plan: "Say what you put on the left; on the right; in the middle of the room; between the sofa and

the bookcase; in front of the television". And in such a way, gradually, students cope with the task. Developing dialogical and monological speech skills on the theme "Family" (6 grade), a teacher could offer the situation:

"You have a new friend and he (she) wants to know about your family". Students work in pairs.

All the above mentioned methods and techniques of training, types of work help increase the effectiveness of the lesson, involve children in the active independent speech activity, make foreign languages teaching and learning process interesting for students.

Thus, the need for enhancement of independent work skills of students in the educational process has been raised in recent years. The technological revolution has demanded human mobility and adaptation to constantly changing conditions of life. Today's worker of any sector of the economy should be able to manage the increasing flow of information. In our opinion, organization of students' independent work depends much on professional competence and creativity of a teacher; his ability and skills in the use innovative pedagogical technologies.

In conclusion we resume that development of students independent work skills at foreign language classes will create better opportunities for improvement of their creative, cognitive potential in the assimilation of language and culture.

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# HOLISTIC EDUCATIONAL PROCESS IN DIDACTIC UNITY OF CONTRADICTION AND CONNECTEDNESS WITHIN COMPETENCE FORMATION

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The purpose statement of this article is into philosophical categories of integrity of the educational process. These categories are regarded as basic characteristics of ensuring the teaching quality of subjective activities and also as conditions of objective result presentation in the framework of competence approach.

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**Keywords:** wholeness, relativity, connectivity, system, interaction, result, determinants discriminants, edutainment, modern educational technologies

Carrying on the campaign for educational reforms guides scientific and civil society towards European integration, harmonization of quality standards, also universalization of the requirements for the content of bachelareate education and intensification of the output results. This fact determines the relevance of scientific research throughout the identification of competence approach patterns, didactic conditions for the integral component of the holistic educational process in a university.

The current studies add the definition of wholeness to almost all the characteristics of educational reality. But usually both common and scientific meanings are considered [14, p. 12]. According to V.V. Serikov, the concept of wholeness is based on completeness, comprehensiveness, indivisibility and inseparability of one educational phenomenon from the other, combinability and co-existence of elements.

Academic understanding of "wholeness" reflects the integrity of philosophical, scientific grounds and categories. "Wholeness" is traditionally defined as the highest form of organization, coherence and alignment. It is regarded throughout the qualitative autonomy and self-sufficiency of the subject, the measure of integration within the internal and external conditions as well as the ability of an object for self-movement and self-development [15].

The educational process in a university (education in the humanities) is based on the best traditions of teaching and training practices of baccalaureate students. It also includes modern achievements of fundamental and applied Pedagogy. It is necessary to carefully maintain, preserve and actively use the traditional procedure of building trusting relationship between the subjects of the educational process. It may be fulfilled throughout the effective and creative usage of gained experience, the change of existing reality and its transformation into pedagogical reality of tomorrow [8, 11].

The correlation of traditions and innovations carried out in the period of large-scale transformations and changes acquires a special significance. The transition to a new qualitative state is mediated with the help of different mechanisms of natural selecting or choosing the optimal problem solutions. In this respect, the pedagogical traditions accumulated by the history of education are regarded as the guarantor of formation and development of the innovative university educational process. At the same time they should be considered as some conditions for obtaining the expected results in the optimal ratio of quantity and quality [6].

Competence approach initiates the search for new patterns of educational process. It discloses the specifics of its organization from the standpoint of an active subject interaction of participants. The interaction is accompanied by the content development of baccalaureate educational programmes, personal acknowledgement of valuable educational importance, acquisition of educational subjective meaning, development of communication skills and abilities to apply the knowledge in solving learning practical-oriented tasks in an atmosphere of trust and mutual support and responsibility for the outcome [10].

Quantitative and qualitative changes in education are always associated with the requirements to improve the educational means and to change the level of technical and technological equipment of a lesson. They inevitably lead to the realization of the actual need for correcting the educational process with the help of some new approaches modeled to determine the nature and content of pedagogical interaction.

Quality as a characteristic is determined according to the fundamental understanding of "feature" concept. Feature is a way to express the essence of a system in relation to the other systems with which they interact. Quality shows signs of external and internal certainty. It is regarded as the totality of objective

characteristics, if the units lose this totality, they cease to be what they are [15, p. 160].

Subjective interaction within the holistic educational process may get completely new qualitative characteristics. V.V. Serikov draws our attention to the fact that the latter are: internal determination of functioning and developing the wholeness, its own ability to self-develop (under the influence of some internal contradictions); representation of the “wholeness” as some existence of contradictions caused by “self-movement” of the holistic system; irreducibility of the wholeness to the unity of its own features or its constituent features. Wholeness almost always acts as a product of genesis or evolution manifested in the growth of its internal organization, anti-entropy and independence from the environment [14].

There are different levels of “wholeness” manifestation: structural, systemic, functional, informational, symbolic etc. The highest form of “wholeness” is the ideal spiritual content organization, which possesses its being in the phenomenon of an individual [15].

The holistic educational process is traditionally provided with the didactic conditions which should be regarded within the technological content of implementing the requirements for pedagogical support [10]. It is necessary to consider the following requirements:

- setting goals and determining didactic objectives and means of obtaining the results;
- finding the optimal combination of traditional and innovative approaches and methods;
- varying the different forms of conducting classes;
- using the practice oriented diagnostic techniques, organizing control, assessing educational achievements of students, evaluating subjective levels and indicators of their civility;
- matching result characteristics and quality indicators.

Pedagogical support is regarded as a way to organize and maintain a modern educational process in a university (education in the humanities). Pedagogical maintenance of goals and objectives of an individual educational process includes checking students' emotional spirit, monitoring different pedagogical situations and complying technological procedural requirements. Emotional spirit is provided while introducing various educational methods, implementing different means of pedagogical support and maintenance of students' creativity or constructing relations (peer, group or collective) [10].

In case of a holistic educational process the educational results should not be viewed as the amount of the acquired knowledge but as a diverse set of students' abilities to apply the knowledge in practice. It is also necessary

to consider a fundamentally different quality of achievements that has an interdisciplinary generalizing character. The latter is determined by the specificity of educational and learning activities of the subjects of the educational process, and also throughout the personal growth and enlarging the range of personal characteristics [9]. Qualitatively new results cannot be achieved without specially organized process support. In a joint venture it reveals *internal students' reserves* including means and methods of implementing the *potential* [7, p. 9].

Thus, the transition from mass education to the practice of organizing electoral education (educational services targeted at the consumer) must be and will be accompanied by the corresponding changes of level and content of pedagogical support within this process [9, p. 125].

Education should contribute to development and self-development of students by means of comfortable educational environment and modern educational programmes and methods [2, p. 57]. Traditional educational approaches do not provide students with the abilities to master creative thinking, to look for and find original solutions in a variety of difficult situations. Subject techniques and methods do not guarantee acquisition of continuing education skills by schoolchildren and students, perception of different skills and obtaining the desire to learn throughout life, knowledge of new skills and adaptation to the changing life and working conditions [13, p. 55].

Therefore, the main fundamental characteristics of secondary schools leavers or college and university graduates are the competences (kompetentnost). They cannot be successfully developed if you do not use efficient educational technologies in each educational area and for each academic subject.

Technology used to form the activity-related components and the components of personal competencies (kompetentnost) includes private sub-technologies such as target value and target orientations providing and forming the experience of a reflective activity that help to ensure and implement competence approach [13, p. 60]. However, the problem of categorical uncertainty of the nature and content of competencies (kompetencia, kompetentnost) escalates and continues to hamper the development of the theory and practice of higher education, including higher pedagogical education.

The main indicators of the problem are [9]:

- insufficiently developed theoretical foundations of competence approach in their relation to the goals, objectives and content of subjective educational activities;
- lack of practice oriented mechanisms of substitution, transformation and adaptation

of knowledge and skills fixed in a new educational content in the framework of competence approach;

- necessity to choose criteria and indicators for evaluating educational competencies (kompetencia), components and structural elements of personal professional competence (kompetentnost);

- implicit, indifferent requirements of federal state educational standard for the results of students' educational activities.

Technification of university educational process implies various options for its further improvement, including non-traditional means of Pedagogy based on "edutainment" [3, 4]. Edutainment is a modern educational innovation based on visual, narrative, play, interactive educational techniques, as well as modern information and communication technologies, more informative and less didactic methods of work. It aims at maximizing the shield of comfortable atmosphere during the working process and after it, liaising with the object of learning, attracting his attention, passion for studies, satisfying his interests, taking into account the psychological needs both intentional and unintentional [1, p. 184].

The most significant for the modern education are the latest innovative technologies of interaction, based on the use of non-traditional learning tools, techniques and game [3, 4]. Proprietary methodology and the newest technological solutions are traditionally related to the diagnostic and evaluation of educational achievements. They are defined by the competence (kompetentnost) formation objectives and provided with the help of practice-oriented mechanisms of substitution, transformation and adaptation of knowledge and skills provided by descriptors and competencies (kompetencia) [12, p. 116–117]. The choice adequacy of the diagnostic tools of professional competence (kompetentnost) formation and the successful identification of university students' educational achievements suggest: level indicators; diagnostic procedures for assessing the dynamics of changes in personal characteristics and parameters of activity or communication; comparative methods of evaluation, ranging, classification etc. [12].

In conclusion, it should be noted that the technology of competence formation including personal and activity components allows tracking the process of students' promotion in forming a predetermined level during each lesson or period. It should be regarded within the acquisition of relevant experience in different procedures, operations, actions specifically in-

cluded in the integrated educational, occupational, social, communicative, reflexive, self-educational and other activities [5, 13].

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## SOME CONSIDERATIONS ON STRUCTURING STUDENT INTERACTION TO PROMOTE ENGLISH LANGUAGE LEARNING

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The problem of interactive approach to English Language teaching and learning is treated in terms of ARIAS (Accountability, Rewards, Interdependence, Assignments, and Social Skills). The emphasis is placed on the effective ways of promoting student interaction through structuring to the peers their activities and assigning different roles that require each student's specific speech behavior and result in more active peers' interaction.

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**Keywords:** interaction, accountability, assignment, interdependence, rewards, structuring, summarizer, elaborator, facilitator

The shift in emphasis in language teaching from a teacher-directed approach to a learner-center one, along with the perceived need to promote learners' efforts at developing autonomy, has resulted in new challenges for a foreign language teacher. The extent to which an increasing awareness of self-directed learning will result in gains in the short or long term, or will simply motivate students to become more autonomous in their learning has not yet been demonstrated. However, encouraged language learners become more involved in managing their own learning in an appealing notion for several reasons. One of the reasons is that learning is more effective when learners are active in the learning process, assuming responsibility for their learning and participating in the decisions that affect it. Particularly for a mixed ability groups of students, the promotion of learner independence in language study can provide means to meet the differing needs, expectations, and proficiency levels of individual learners that may not be met in a group-oriented classroom setting. On the other hand, the need for developing a greater autonomy in language learning can be seen as one facet of lifelong learning, in which each individual effectively makes decisions about which learning path to take. Nonetheless, language teachers may feel uneasy about encouraging implementing practices aimed at developing learner independence in an academic setting, where student's attention is largely focused on completing other program requirements.

They may also perform their traditional roles as language experts, as providers and directors of knowledge. They may have misgivings about the ability of learners to organize themselves to work productively and independently.

With both the advantages and possible pitfalls of promoting learner independence in mind, we decided to introduce a self-directed element in the English course for the would be interpreters in the third year of study. The one-year program aimed at developing

students' independent reading and speaking skills in the English language is very demanding on students' time and energies. That is why any initiative to foster learner autonomy has to be flexible enough to fit our course and program constraints, as well as provide for learner choice.

One solution we have found to be effective was the structuring of a student interaction for promoting learning.

It is a common knowledge that a classroom may not have a computer, teaching aides, or the latest sophisticated materials, but every classroom has students. However, the main goal of an English teacher is to find the ways to maximize student's learning through student-student interaction rather than direct teacher-student one. Compared to the traditional lecture approach, interactive methods have a number of advantages that have been reported in a number of research reviews on peer-interactive methods [1, p. 54–65]. In addition to higher levels of academic achievement, an increase in self-esteem, attendance, and a liking for school, an increase in mutual concern among students and the development of positive peer relationships have also been reported.

Merely putting students in groups isn't enough. Student interaction needs to be structured. In the ESL/EFL classroom, developing proficiency in reading, writing, listening, and speaking the target language, as well as acquiring knowledge of culture, are core instructional goals. Student interaction also needs to be structured so that many benefits of peer-interactive approaches can come about.

In order to provide harmonious student interaction, a teacher should successfully orchestrate a classroom interaction taking into account the issues of Accountability, Rewards, Interdependence, Assignments, and Social Skills (the acronym ARIAS).

Accountability means that students must make worthwhile individual contributions as well as benefit from contributions made by others. Group learning and performance depends

on both individual accountability and group interdependence; group members sink or swim together – i.e., for anyone in the group to succeed, everyone in the group must succeed.

Both individual accountability and interdependence among students can be structured through rewards (individual /team/ class). Winning a contest based on group competition is one type of reward. A group can also be rewarded without competition. Here, students work in groups to create a group product, and everybody receives the same reward: a grade or other feedback. Or reward may be a combination of an individual's and the team's score (the sum of the quiz scores for all team members). In all these examples, the team reward is designed to promote interdependence among team members. However, continually working in the same team may not contribute to a feeling of overall interdependence among all students in the class. In order to promote the development of a positive overall class spirit, teams can be reformed throughout the year and a class reward may be occasionally awarded. In this case the teams work together to earn a reward that is shared by the entire class.

Individual accountability and group interdependence can also be structured by the assignment. Completing an assignment requires students to be engaged in certain behaviors and complete various subtasks. For example, if three students work together as a group on a composition about the changes they would like to see in their University department, each person can have the task of writing about just one change. Then they would come back together to write an introduction or conclusion, as well as revise each person's paragraph and ensure that the entire composition flows smoothly.

Another way of promoting student interaction is to assign specific role behaviors to students. When first introducing this to the class, it is helpful to give an each student a copy of a responsibility description on each role. For example, students writing a composition may be given the roles of the composition writer, a composition commenter, or an observer of the interaction between these three peers. Students provide their own feedback on the composition according to the role requirements.

One of the effective ways that assignments can be used to structure interaction involves practicing reading, speaking, and listening. Here, students can be assigned to groups of three and instructed to cooperate with each other by performing one of three roles: Summarizer, Elaborator, or Facilitator – roles that represent cognitive tasks thought to be involved in learning. Each student of this triad is given a copy of a text that should be read silently or aloud.

Upon completion reading the text, the Summarizer sums up the main points of the text to the other two members of the group in his / her own words without looking down at the page. This helps clarify the core ideas in the material. The Elaborator then explains the activity by relating to a similar situation; or otherwise discussing the issues involved in the problem. This helps relate the new information to prior knowledge, making it more meaningful and easier to remember. The Facilitator monitors accuracy, makes sure that the triad follows the task and uses the target language, and if there is some time left, asks for an elaboration from the Summarizer, or adds elaboration of his or her own. After students have finished discussing the text (5–10 minutes) and have chosen an answer, the teacher may wish to have a few minutes of general discussion, perhaps soliciting some personal elaborations from triads.

Another technique of using interactive approach is a jigsaw activity. The idea for jigsaw activities comes from jigsaw-puzzles. Just as in a jigsaw, pieces must be put back together to complete the picture. In a jigsaw activity, information is divided into different pieces, each group member is given a piece to learn, and then group members teach each other about their pieces so that everyone has a complete picture of the information. First, the teacher divides the material into enough pieces so that each group member has one part. Next, the parts are distributed and people from different groups who have the same part meet to study their parts. These new groups are called expert teams. After studying their pieces of information, students return to their original groups and teach their piece to the other group members. Finally, the entire group demonstrates the knowledge by using the information to complete a task or answer questions. An example of jigsaw activity can be illustrated by the following: a teacher puts students into groups of four, and, after introducing vocabulary used for describing people, gives a cartoon about family members to every person in a group. The students with the same cartoon then get together in expert teams to read and understand their pieces. Then, they return and describe the cartoon to the group mates without showing it. Afterwards, students are given a test covering the information in all four cartoons, with their scores being partly based on how well their group mates had performed.

As one can see, this jigsaw activity involves all five parts of ARIAS. One, there is an individual accountability, because group member are all responsible for learning and teaching their cartoon. Two, there are rewards for cooperation. Teaching the group mates about the cartoon they have read, students raise

everyone's score as well as their own. Three, there is an interdependence because students make their fellow group members describe them the cartoons they have not seen. Four, assignments are equally divided among all group members. Five, social skills are being developed as students must be both good speakers explaining their cartoons so that others could understand and be good listeners, being sure that they find out all necessary information.

Although the potential of properly structured peer interaction for improving learning is great, there are some concerns regarding the implementation of these activities in the ESL/EFL classes that need to be addressed.

These concerns fall broadly into two categories:

1) those related to the students' limited English ability;

2) those related to a classroom management.

The first category includes a lack of a correct model of the target form of English, inaccurate modeling, and insufficient or faulty feedback.

The second category includes group formation, maintaining order, learner's use of their native language at inappropriate times, evaluation, and suitability for varied cultural and learning styles.

The concerns based on students' proficiency level are important because students speak much more when peer interactive methods are applied rather than when the class is conducted in a teacher-fronted classroom. Even, if teachers' English is not that of a standard variety of English, it will almost always be close to a standard variety than students' English. With peer interactive methods, students hear each others' English, which may not be accurate phonologically, syntactically, lexically, or sociolinguistically. However, many linguists state that learners can discriminate between standard and non-standard English and can acquire more native-like English as their proficiency increases.

Another concern is that students' lack of ability may cause them to give the peers inaccurate feedback; for example, telling them that something they said was wrong when, in reality, it was correct. In addition, students' awareness about their poor English language proficiency level may lead them to shy away from providing any feedback at all.

In contrast, as they say, in a teacher-fronted classroom, the students have the teacher as their model and, at least theoretically, can get an immediate and accurate feedback. However, in reality, few students in such classes are lucky enough to receive much individual feedback.

Long and Parter (1985) report the striking fact that each EFL student has only 30 seconds

per a lesson to practice their English in a teacher-fronted classroom of 30 EFL students. This means, each student has only one hour of practice per year. Even though, the students receive an accurate feedback, during such time, which is just not enough. Therefore, when teachers dominate the instructional time, students may have a good model and receive correct feedback, but students have few opportunities to produce any language of their own in the class, and consequently receive little individualized feedback.

As for the accuracy of a feedback, some English teachers found that their students never miscorrected each other during unsupervised group work.

In summary, then, even though students are not as good as teachers in providing a correct language model and feedback, during peer-interacting activities, students can participate more actively and provide each other with an authentic communication practice. In this case, the lack of target-level modeling and feedback may be considered to be an acceptable trade-off for an increased student participation and productivity. Further, by carefully structuring the activity, teachers can reduce the possible effects of students' English deficiencies. For example, by linking a cooperative activity with a reading passage, teachers can provide students with the vocabulary they can use while talking in their classroom.

Classroom management is the second area of concern when peer-interactive methods are used. Teachers may at times be reluctant to try implementing group activities because they fear chaos will result. It should be in mind that putting students in groups does not mean that it is a teatime for teachers. In fact, teachers can and should remain an integral part of cooperative learning in the classroom.

Teachers should control the classroom in three ways:

1) by structuring the group activities;

2) by teaching students the skills necessary to work efficiently in groups;

3) by walking from group to group coordinating and supporting when groups face challenges, giving feedback, and making sure that students follow their task.

Another problem for a teacher is to decide how many students to put into a group and what students to put together. Some experts (Rogers, Dansereau) on cooperative learning suggest that pairs or groups of three or four are best when students are first learning to work together. Also, the smaller the group, the more each person gets to talk. However, larger groups mean more people to share ideas.

Answering the question how to divide students into groups, some researchers note that

groups should be mixed in terms of ability and other characteristics, e.g. forming heterogeneous groups; others consider homogeneous groups are more appropriate for the students of peer interactive cooperation.

Another aspect of classroom management that some teachers may be concerned about is that students may use their native language during peer interacting learning. To tell the truth, the use of a native language is not always regarded as inappropriate. For example, if students are trying to understand the activity procedure better, it might be helpful if they were allowed to use their native language to some extent. If, however, students prefer speaking their native language rather than expressing their thoughts in English, they should be discouraged from doing so. One way to deal with this is to give one student in each group the role of monitoring the group members' target-language use.

Teachers might further be puzzled about how they can evaluate individual students during peer-interaction learning. They may wonder how to determine what each student actually did and learned during cooperative learning activities. There are two answers to this concern. First, individual assessment is often a part of peer-interactive methods. Students can be tested individually or called on randomly to answer questions on material student in a group. Second, group methods are only one part of teachers' repertoire of methods. Their teachers have opportunities to evaluate their students during other activities.

A final consideration that must be taken into account is the students' cultural and social values, their expectations about classroom learning, and their personal learning styles because

values and expectations vary from country to country, place to place, and person to person. Therefore, this context cooperative group work will need more practice for some students due to different cultural values, past experience and cognitive styles. This should be considered not so much as an objection to cooperative learning but as a reminder that caution must be exercised before introducing any new curricular approach. As it has been already mentioned, peer-interactive methods are proposed as one type of classroom activity; how the methods are implemented and integrated into the existing curriculum are best judged by teachers who know their students best.

However, the social significance of cooperative learning methods cannot be understated because by creating conditions that encourage students to cooperate in a team or a group, we not only motivate students to become more autonomous, active and responsible for their learning of course material, but, perhaps more importantly, help students turn into better citizens of their world.

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*Materials of Conferences***PEDAGOGIC ASPECT OF INTERACTION  
BETWEEN MEDICAL DEONTOLOGY,  
ETHIC, AND SPEECH ETIQUETTE  
FOR A DOCTOR OF GENERAL PRACTICE**

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**Urgency.** Special features of profession in doctor of general practice (DGP) are such that a DGP personally meets a patient with whom they have to establish communication, therefore, training interns of senior courses should be provided with an organic relation between general classic methods of tutorship and medical deontology, ethics, and speech aspect of treatment.

**Research objective.** Studying interaction between medical deontology, ethics, and word of a general practice doctor during reception of patients in polyclinic, traumatological centers, etc.

**Methods and materials.** The research was help within practice of 6–7 year interns via observation of their dialogue with patients, this method provided for improvement in education quality – solution of pedagogic problems. During the process of questioning we understood that interns have no skills in rhetoric, and they are used to reply via computer method only. We took 7 groups of interns, 8 students each, who took training in the first semester of 2015–2016 training year, compared them, held questioning, in other words, clinical exam on discipline “surgical diseases” in oral form and during reception of patients, then in written form via testing method. The results, received from the written form of testing were better because it required a simple “yes” or “no” answer, while oral responds required rhetoric culture, in other words, relation between medical deontology, ethic, and oral etiquette.

**Results and discussion.** The most important methods of harmonizing communication between doctor and patient that provides for successful realization of the basic professional objective – treat the patient, are politeness and speech etiquette. Academy member V.M. Bekhterov claimed: “if a patient doesn’t feel better after talking to doctor, it isn’t a doctor”. Therefore, language of professional doctors and their speech behavior are important components of research, as people say: “a word can heal, but also injure”.

Regretfully, violation of speech ethic takes place frequently in life and medical area: pa-

tients can be rude to a doctor, or the other way around in medical institutions where interns take practice. Sometimes it is necessary to ask participants to watch their language. Deontology and medical ethic is a science that generalizes behavior principles for medical personnel, including doctor, that provide for establishing the required atmosphere in diagnostic, treatment, and rehabilitation of patients.

In order to replace “doctoral ethic”, in 1944 surgeon N.N. Petrov introduced the term “medical deontology (ancient Greek “proper, correct study”).

In reality each doctor cares after their patients, but not all of them are able to show their feelings to patients and convince them. Without doctoral speech etiquette communication with a patient cannot take place, this aspect distinguishes the profession of doctor from all other kind of human activity.

Professional speech culture of a doctor must not use words that have doubtful meaning thus causing a negative reaction of a patient. Before speaking with a patient, doctor of general practice must weigh his every word for its effect of influencing patient’s soul and psychic. An important component of communicating with a patient is convincingness, but sometimes, “a saving lie is better than truth that hurts a patient’s soul”. Obtaining skills of using words with care while maintaining dialogue with a patient, some interns remember certain standards of communicating with patients in their future work, but individual approach should be used in each case.

Knowledge is the only common thing between people, without which no specialist can deal. Huge importance is attached to the knowledge of a physician, as “mediocre doctor, more harmful, than helpful (M.Ya. Mudrov)”. It is necessary to mention, that medical knowledge is safe and beneficial only in the hands of people with a clear conscience and integrity, steadfast moral and ethical principles, and an exaggerated sense of fanatical loyalty to the professional duty of medical heart and soul. People with a deficiency of these qualities can use their knowledge to take advantage, and such a concern, “do no harm” (Hippocrates) always accompanied humanity today.

**Conclusion**

The pedagogical aspect (opinion) should be directed to the preservation of the noble ethical

traditions of medicine- it is one of the main tasks in the interaction of medical deontology, ethics and etiquette of speech not only for the general practitioner.

Given the specificity of the medical profession, medical ethics, deontology and speech etiquette are a necessary and indispensable feature of his professional activity, vicious people should be denied access to this particular sphere of human existence, which requires people honest, wise and courageous.

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## ASSESSMENT OF THE INSOLVENCY RISK FOR NON-FINANCIAL ENTERPRISES: CASE OF KAZAKHSTAN

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The possibility for the application of foreign insolvency risk assessment techniques and methods on Kazakhstan non-financial enterprises was analysed in the course of this work. Furthermore, article covers scientific investigations of foreign and national authors into the insolvency assessment questions. Statistical data on liquidated and rehabilitated companies in the country is presented. Paper describes the insolvency risk forecasting accuracy on the practical application of five different bankruptcy risk assessment models on 30 Kazakhstan non-financial enterprises and covers results of this analysis.

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**Keywords:** economic analysis, insolvency, bankruptcy, financial risk

Today's free competition markets allow not only unlimited amount of market participants, labor and resources flexibility, but also a possibility to exit market and stop the activities of the company or organization by some specific reasons. The institution of bankruptcy is a system of procedures for the settlement of insolvent entity's debts, by applying bankruptcy proceedings and rehabilitation measures. The main purpose of the bankruptcy procedures application is to exclude inefficient participants from the market, and early involvement to some other market operations debtors' capital and human resources, in order to avoid the problem of inefficiency and waste of resources. Bankruptcy institution is an important part of market economy system, which affects the behavior of economic subjects and enhances competition. So far, the studies on insolvency assessment models are not presented widely in Kazakhstan. Only few authors investigated into that topic, moreover, no international insolvency assessment model was adopted for Kazakhstan economic environment.

The goal of this paper is the evaluation of foreign models application and development of methodological framework for the most effective insolvency risk assessment for non-financial organization in conditions of Kazakhstan's economy. The main objectives are:

- Analyze the financial, economic and legal aspects of the insolvency related process in Kazakhstan;
- Analyze insolvency prediction indicators and models, scientific works and studies introduced by foreign and Kazakhstan scientists;
- Apply bankruptcy prediction models of three different classes in practice on the example of Kazakhstan enterprises and draw conclusions and perform qualitative evaluation of those models' effectiveness and accuracy.

The object of the study are non-financial enterprises of Kazakhstan, therefore the sub-

ject is the verification of 5 insolvency risk assessment models. From that 5 models 3 are discriminant analysis models (Altman  $Z$ ,  $Z'_{\text{China}}$ ,  $Z''_{\text{Japan}}$ ) [1, 2, 3, 7], one logit-probit class model (Ohlson) [11] and one naïve model (David Durand) [6]. There are two hypothesis of the study (H1, H2) – Insufficient values of liquidity coefficients are the signals for the managers to start insolvency investigation process (H1), insolvency risk assessment models introduced by foreign investigators have to be checked and verified to be used for the domestic enterprises' insolvency risk assessment (H2).

### Review of scientific literature

Early models used to predict companies' bankruptcy were based on the financial ratio analysis using univariate and multivariate statistics methods. A univariate approaches investigates the relationship of some individual ratios and the insolvency. Such approaches were not efficient enough; moreover they were able to predict the case of bankruptcy with limited accuracy and in a very close period before bankruptcy. The multivariate approach uses the polled financial ratios for the insolvency prediction. For the efficient construction of multivariate model for the bankruptcy prediction it is vital to determine which financial ratios should be used and how they should be weighted.

In the work of M.F. Salakhiyeva [12] insolvency prediction models are classified in the various ways, author used offered classification and with some minor changes this classification is showed in a Table 1. This table represents classification of bankruptcy prediction models according to several criteria as in the article of M.F. Salakhiyeva. Next milestone of the insolvency related studies was the logistic regression analysis which is equivalent to the two-group discriminant analysis.

Table 1

Classification of the assessment models

Model	Classification features				
	Geography of the origins	Application horizons	Scale of the forecasted enterprise	Formalization level	Data processing type
Altman	Developed in a country with market economy	Distant, long-term	Enterprises of any size	Qualitative, Statistical, Discriminant	No need in special software
D. Du-rand	Developed in a country with market economy	Distant, medium-term	Enterprises of any size	Qualitative, Statistical, Scoring	No need in special software
Kralicek	Developed in a country with market economy	Distant, long-term	Enterprises of any size	Qualitative, Statistical	No need in special software
J. Ohlson	Developed in a country with market economy	Distant, medium-term	Enterprises of any size	Qualitative, Statistical, Discriminant	No need in special software
Scoring models	Developed in a country with market economy / Developed in a country with transition economy	On place, medium-term	Enterprises of any size	Mixed, scoring models	Requires special software

Note. Set up by authors, on the basis [12].

The logistic procedure fits linear logistic regression models for binary or ordinal response data using Maximum Likelihood estimations and compares the estimated samples using Wald chi-square. The Maximum Likelihood procedure is used in an iterative manner to identify the most likely estimates for the coefficients. The Wald statistic is used to test the hypothesis that a coefficient varies from zero [8].

There are many specific probabilistic choice models, and two of the most widely used models are the multinomial logit (MNL) and multinomial probit (MNP) models. Logistic regression analysis has the advantage of being less affected than discriminant analysis, when basic assumptions, such as the normality of the variables are violated.

Further, Recursive Partitioning Algorithm (RPA) followed. Recursive Partitioning Analysis is a nonparametric technique, which minimizes the expected cost of misclassification by a univariate splitting procedure [8]. However, RPA does not provide the probabilities of group membership, or a means for evaluating the significance of variables.

Finally, Artificial Neural Networks (ANN) is the latest bankruptcy prediction model. An artificial neural network system (ANN) is a computer algorithm which can be 'trained' to imitate the cellular connections in the human brain. It consists of a large number of interconnected elementary processing units to compute data. The network's processing results are derived from the collective behavior

of its units and are dependent on how the units interact with each other. By processing and evaluating the interactions in a complex set of prior data, a neural network attempts to assign proper weights to the respective inputs to allow for the correct deduction of the ultimate outcome. These input weights are aided by a 'genetic algorithm' optimization procedure, which simulates the model's predictive power under a large number of scenarios and allows the best weighting schemes to survive and reproduce from one generation to the next.

### Research methodology

This chapter deals with insolvency statistics and describes general characteristics and methods of the research. In the years 1993–1994 level of inflation in Kazakhstan and other post-Soviet countries went up to catastrophic values. Prices on raw materials grew up significantly and at the same time supply fell dramatically. During the period of time enterprises accumulated huge debts to banks, consequently amounts of interest payments and penalties increased as well, moreover debts to government budget and non-budget organizations rocketed. Nevertheless, management of companies continued to take borrowings and take credit from the same banks with the same huge interests. All these led to the case when majority of the enterprises had such amount of liabilities which exceeded their assets. Majority of these liabilities were debts to commercial banks, other were

liabilities on utilities, non-budgetary organizations and wages to employees.

Finally, hundreds of companies were proclaimed as insolvent or liquidated during the privatization processes. The main reasons for such events were management incompetence and lack of experience and wrong macroeconomic policy of the government.

As it was mentioned before, first law on enterprises insolvency was not efficient enough, and only after the changes in 2006, when rehabilitation procedures were improved some visible positive changes became noticeable. Table 2 illustrates information on the dynamics of Kazakh's enterprises insolvency on the period from 2007 to 2012. In order to fulfill goals of the work sample of 30 different non-financial enterprises which are publicly traded on Kazakhstan Stock Exchange (KASE) [11] was selected. These companies represent industrial (53,33%), manufacturing (13,33%), construction (13,33%), agricultural (10%) and transportation (10%) companies.

Among those companies 6 are bankrupt, and the rest 24 for are operating entities. For the selected sample financial reports on the periods from 2006 to 2013 were used. Figure illustrates the division of investigated enterprises by industries. Furthermore, 5 models of three different classes were chosen: David Durand Model [6], Altman – Z Score [1], Altman –  $Z'_{China}$  Score [3], Ohlson Model [11] and  $Z''$  – Score Model for Japan [7].

**Table 2**

Dynamics of Kazakhstan's enterprises insolvency [10]

Yeas	2007	2008	2009	2010	2011	2012
Amount of enterprises	2507	2638	2627	2817	1971	1939

Note. Calculated based on data from the National Statistic agency of RK.

First multivariate model was presented by Altman in 1968 [1] who used multivariate discriminant analysis (MDA) to develop a five-factor model in order to predict bankruptcy for manufacturing firms. MDA computes the discriminant coefficients and selects the appropriate weights (cut-off score) which will separate the average values of each group, while minimizing the statistical distance of each observation and its own group means:

$$Z = 1,2X_1 + 1,4X_2 + 3,3X_3 + 0,6X_4 + 1,0X_5. \quad (1)$$

Later, model was adopted and calibrated by economists for various countries [3, 7]:

$$Z'_{China} = 0,517 - 0,460X_1 + 9,320X_2 + 0,388X_3 + 1,158X_4; \quad (2)$$

$$Z''_{Japan} = -0,833 + 0,388X_1 + 1,158X_2 + 9,320X_6 - 0,460X_7. \quad (3)$$

Ohlson used statistics of 2000 companies, from which 135 were bankrupt, bigger amount of investigated companies makes results of the model more accurate [11]:

$$O = -1,32 - 0,407X_8 + 6,03X_7 - 1,43X_1 + 0,0757X_9 - 1,72X_{10} - 2,37X_6 - 1,83X_{11} + 0,285X_{12} - 0,521X_{13}. \quad (4)$$

After those nine coefficients are calculated model works with almost the same logic as Altman Z-score, and all unknown variable in the formula (3) are substituted with the results. Obtained value of the O-score itself does not represent the probability of the insolvency, but may be transformed into probability using following formula:

$$\frac{1}{1 + e^{O-score}}. \quad (5)$$

These models represent three different classes of insolvency risk prediction models: naïve, discriminant analysis and logit-probit models. Table 3 demonstrates the frequency analysis of the ratios used in the research. Moreover, it describes X-coefficients used in models for risk assessment. In both cases, after final values of Z or O scores are calculated, those values are evaluated on the fixed scales and the company is identified as bankrupt or stable.

### Empirical analysis and results verification

Table 4 represents the fragment of the enterprises' classifications according to the assessment models results according to 5 different models; moreover actual state of the enterprises' is shown.

After all calculations and evaluations were performed authors calculated errors and the accuracy of the models applied. Accuracy test was performed on the same logic as in Altman's work [4], where the verification of the classification was based on the investigation of the 2 types of errors: Error 1 – According to the assessment results enterprise is defined as solvent, but in fact this company is insolvent; Error 2 – According to the assessment results enterprise is classified as insolvent, but in fact it is financially stable and solvent entity.

Finally, when all models were applied to the investigated companies accuracy test was performed. Results of the accuracy test are introduced in the Table 5.

Table 3

## Ratios frequency analysis

Ratios	Z	Z'	Z''	Oo	Dd	SUM
Working capital / total assets ( $X_1$ )	+	+	+	+		4
Retained Earnings / Total Assets ( $X_2$ )	+	+	+			3
Earnings Before Interest and Taxes / Total Assets ( $X_3$ )	+		+			2
Market Value of Equity / Book Value of Total Liabilities ( $X_4$ )	+		+			2
Sales / Total Assets ( $X_5$ )	+		+			2
Net income / total assets ( $X_6$ )		+		+		2
Total liabilities / total assets ( $X_7$ )		+		+		2
LOG (total assets / GNP price-level index) ( $X_8$ )				+		1
Current liabilities / current assets ( $X_9$ )				+		1
One if total liabilities exceeds total assets, zero otherwise ( $X_{10}$ )				+		1
Funds provided by operations / total liabilities ( $X_{11}$ )				+		1
One if net income negative for the last two years, zero otherwise ( $X_{12}$ )				+		1
$\frac{NetIncome(t) - NetIncome(t-1)}{ NetIncome(t)  +  NetIncome(t-1) }$ ( $X_{13}$ )				+		1
NPAT / Average assets ( $X_{14}$ )					+	1
Current Assets / Current Liabilities ( $X_{15}$ )					+	1
OE / total assets ( $X_{16}$ )					+	1

Note: Z – Altman Z-Score; Z' – Altman Z for China; Z'' – Altman Z for Japan; Oo – Ohlson O-Score; Dd – David Durand model.

Table 4

## Fragment of insolvency assessment models calculations

Enter- prise	Model					Real state of the firm	Assessment result				
	Z	Z'	Z''	O <sub>o</sub>	D <sub>d</sub>		P_Z	P_Z'	P_Z''	P_O <sub>o</sub>	P_D <sub>d</sub>
1	1,48	0,18	-0,60	1,00	26,24	B	B	B	N	B	B
2	1,21	0,30	-0,81	1,00	0,00	B	B	B	N	B	B
3	0,94	0,20	-0,15	1,00	39,02	B	B	B	N	B	N
4	1,12	0,19	-0,56	1,00	18,74	B	B	B	N	B	B
5	0,48	1,83	-1,54	0,93	0,00	B	B	N	B	B	B
6	-1,59	-4,10	-2,04	0,71	0,00	B	B	B	B	B	B
<...>											
25	3,61	0,79	0,21	1,00	79,91	N	N	N	N	B	N
26	1,21	0,16	-0,73	1,00	8,15	N	B	B	N	B	B
27	0,46	-1,13	-1,55	0,99	7,35	N	B	B	B	B	B
28	2,92	1,17	-0,47	1,00	35,59	N	N	N	N	B	N
29	0,02	0,29	-1,30	1,00	8,97	N	B	B	B	B	B
30	7,90	-1,37	1,38	1,00	65,21	N	N	B	N	B	N

Note. Constructed based on calculation made by authors.

Table 5

## Results of the models verification

Model	Real state of the enterprise	Amount of correct assessments	Accuracy, %	Amount of misclassifications	Error, %	Total forecasts
Z	B	6	100	0	0	6
	N	16	66,67	8	33,33	24
	Total	22	73,33	8	26,67	30
Z'	B	5	83,33	1	16,67	6
	N	10	41,67	14	58,33	24
	Total	15	50	15	50	30
Z''	B	2	33,33	4	66,67	6
	N	22	91,67	2	8,33	24
	Total	24	80	6	20	30
O <sub>o</sub>	B	6	100	0	0	6
	N	0	0	24	100	24
	Total	6	20	24	80	30
D <sub>d</sub>	B	3	50	3	50	6
	N	24	100	0	0	24
	Total	27	90	3	10	30

Note. Calculated by author based on the investigation results.

According to the analysis original Altman Z-Score is most accurate in the classification of bankrupt companies, as it shows 100% of accuracy in the identification of insolvent companies. The overall accuracy of the model is 73,33%. Nevertheless, David Durand model is 90% accurate. Altman Z' – Score for Japan obtained 80% accuracy. Minimal accuracy was demonstrated by original Altman Z'' – China – 50%.

### Conclusion

Among five applied models Ohlson O-Score has the lowest accuracy and seems to be completely inapplicable in Kazakhstan. The reason for that is different balances sheet structure and value of weighted coefficients. What is about Altman Z-Score models it can be said that this model have to be adjusted for Kazakhstan, as well as David Durand method. As it was concluded by many researches all countries require its own assessment models. Results of the investigation prove that all models should be adapted to the specific conditions of each countries' financial and economic standards and norms for the most accurate and effective application.

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*Materials of Conferences***RELATIONSHIP UNCERTAINTIES  
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One of the priorities is the development of science of business economics. The future for the man was, is and remains unknown, and therefore uncertain. And, as is known, subject in uncertainty decision avoid risks not possible. A characteristic feature of the business is the need for its implementation in the conditions of uncertainty. The uncertainty does not allow advance accurately and reliably determine both the future state of internal and external business environment on different time horizon, and the result of the adoption of this or that enterprise solutions. Proposed in this paper is based on the interpretation of the uncertainty inherent fact of postulating the existence of uncertainty in the world around us and inseparable connection with the uncertainty of the expected result – an event or phenomenon. At the same time, the higher the degree of “blurring” the expected results or effects, the greater the uncertainty. Certainty seems to state the authors of a degenerate case of uncertainty, when the degree of “blurring” the expected result tends to 0. Possible risks inextricably linked to uncertainty and are manifested in the actual results of – an event expected. The greater the uncertainty, the more “smeared” and the expected result is less clear. The result is a degeneration of the concept of risk in a very strong uncertainty, when the expected result is blurred so much that is not clear at all. Under the proposed interpretation in the present study may be a measure of the uncertainty of the value of the range of possible values of a particular characteristic or parameter. The wider the range with the same degree of confidence – the higher uncertainty. At this specified range, depending on the nature of the analyzed indicator, can be measured in different units (natural, cost, labor and others.). In cases where the uncertainty is characterized by a range (interval) that may be expected values of an indicator or sign of such uncertainty will be called the interval. From the essence of interval uncertainty it follows that a measure of this type of uncertainty in relation to the business may serve as the value of the confidence interval of the expected values of the ana-

lyzed index at a fixed level of confidence. There's also another situation where the expected result of – an event or phenomenon can be represented by a set of discrete values. The uncertainty corresponding to this situation, we will call “discrete uncertainty”. For a discrete value of the uncertainty of uncertainty characterized by a vector of expected values of the analyzed indicators. The larger dimension of this vector and the range of its discrete components, the higher the level of uncertainty. In addition, the level of uncertainty discrete depends on the ratio of expected probability of discrete events. If these probabilities are close to each other, the uncertainty is high. Conversely, if the probability of a discrete event (such as winning the tender) is close to 1, and the likelihood of other discrete event (such as a loss or a cancellation of the tender) are close to zero, the uncertainty is low. The introduction of the concepts of continuous and discrete uncertainty helps to clarify and specify the various situations of uncertainty and opens the possibility of adequate quantifying uncertainty in different situations. It is important to note the need for separation of objectively existing uncertainty on its intermittent or discrete assessment. Assessment of the level of uncertainty is always based on certain hypothetical assumptions, models and projections and are not always due to a lack of completeness and reliability of the information available, as well as lack of perfection of models and algorithms used adequately reflects the objectively existing uncertainty. In this context and as a risk assessment of the actual deviations from the expected results will also be unreliable (even when perfectly risk assessment methods), because he is doubtful the expected result.

There are two approaches to the understanding of the relationship of uncertainty and risk. In the first approach the uncertainty manifested in the “fuzziness” of ideas about the expected results or events arising from possible risks. If the risks are great, and the uncertainty is high. Thus, in particular, at high risk of extensive range of expected values of the analyzed indicator business efficiency. For example, if the risks of violating the terms of supply of raw materials are small, and the range of possible delivery time will be quite narrow, as expected small deviations from the planned deadline. This situation corresponds to a low uncertainty. The second approach to understanding the relationship of risk and uncertainty risks are not laid within the expected range

of values of the analyzed trait or expected set of discrete events. With this approach, they appear in the actual value of the miss of the analyzed feature in its range of expected values, or in the implementation of discrete events, not belonging to the set of expected events. For example, if the expected event is winning or losing the tender, and the tender was canceled, it was realized the risk of cancellation of the tender, which was not taken into account in the set of possible events. Or, if taking into account the expected risks specific range forecast economic profitability of the business entity, as a result of the implementation of external risks unaccounted actual profitability was below the lower limit of the expected range, it also shows insufficient complete account possible risks when assessing uncertainty. Therefore it seems more appropriate to the first approach, assuming that the level of uncertainty determined by the system and the possible risks more accurately and reliably evaluated the integral impact of the risks, the more accurately defined the level of uncertainty of the analyzed situation. It should be noted that the risk management measures change the level of uncertainty.

And effective risk management measures, increase the level of uncertainty, when the expected

events or results to implement these measures have been adverse events or results. Conversely, if the anticipated events or results to implement effective risk management measures have to be sufficiently positive and negative events or results, the uncertainty is reduced and the expected range or a set of possible values of the shifts in the direction of positive expectations.

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## STUDY OF THE EFFECT OF LED LIGHTING ON THE DYNAMICS OF SOME INDICATORS OF ENDOCRINE STATUS AND FUNCTIONAL ACTIVITY OF NEUTROPHILS IN PATIENTS WITH NEUROTIC DISORDERS AND STUDENT VOLUNTEERS

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This article is devoted to the study of the effect of led lighting on endocrine response and some of the indicators of the functional activity of the segmented neutrophils in patients suffering from various forms of neurosis and student volunteers. Stress-caused forms of neurotic disorders are accompanied by inhibition of the adhesion ability of neutrophilic granulocytes, while maintaining their metabolic functions in NBT – test. Under the influence of treatment of patients with neuroses with anxiety, antioxidants, immunomodulators and hyperbaric oxygenation, as used in the conditions of influence of led and fluorescent lighting, an increase of the phagocytic activity of neutrophils, stimulation of NBT – test and normalization of some indicators of hormonal status. Fluorescent light sources are statistically significant differences in the functioning of neutrophils in the group of students is not called in this case, the plasma concentration of a hormone of stress-realizing system – cortisol increases. Identified interdependencies between the degree of change in the hormonal profile, functional indices of activity of neutrophil granulocytes and a view of the impact of different light sources allow to examine the immune and endocrine abnormalities as a prognostic marker of adverse external influence of optical factors.

**Keywords:** led lighting, endocrine reactions, neurotic disorders, functional activity of neutrophilic granulocytes

Investigation of the effect of light sources, including LED light on the endocrine status and the morphological and functional characteristics of neutrophilic granulocytes is a challenge due to the fact, that labile and plastic neutrophils capable of rapid response to any damaging external influences, as well as the endocrine response to quickly react to stress environmental factors, so the violation of these indicators can be used as a predictor of adverse impact of optical factors. [1, 2, 3, 4, 7, 13, 14, 19, 20, 22]. Study of different types of light sources necessary for life safety not only by using the light rays to highlight the premises, but also in connection with their use as therapeutic factors in various diseases [1, 2, 3]. Identified by a number of researchers phase changes of intracellular pH, esterase and phagocytic activity of neutrophils associated with damaging effect of UV radiation on cells, determines the relevance of the study of LED light sources, which are absent in the spectrum of damaging ultraviolet rays [1, 2, 3, 8]. The study of homeostatic parameters of the organism, reflecting the state of the immune and endocrine status, is especially important in patients suffering from stress-induced disorders, as exposed to stressful environmental factors develop disorders of a conjugate between nervous, endocrine and immune systems, as shown in our previous experimental and clinical studies [6, 9, 10, 11, 12, 15, 16, 17, 18, 21].

**The purpose of the research** – to study the effect of LED light on the dynamics of pituitary hormones, thyroid gland, adrenal glands, as well as the functional activity of neutrophils

in patients with neurotic disorders and students – volunteers to highlight the prognostic markers of the adverse effects of external optical factors.

### Materials and methods of research

A simple randomized comparative parallel group study involving 62 patients (37 women and 25 men), mean age  $23,3 \pm 3,2$  years, suffering from various forms of neuroses and were hospitalized in the Republic of Mordovia GBUZ "Mordovia Republican Psychiatric Hospital". The criterion for inclusion of patients in the observation was the presence of obsessive-phobic, conversion or asthenic disorders, stress-related, significant for the patient and the relevant ICD 10 (neurasthenia – F 48,0; obsessive-compulsive disorder – F 42,0–42,9; conversion disorder – F 44,0–44,7). The exceptions were identified and acute exacerbation of chronic diseases of internal organs, the presence of organic causes of mental disorder, oncopathology, long prior to receiving psychopharmacological drugs, claustrophobia, used to treat intolerance to drugs. All studies were carried out with the consent of the patients, in accordance with Article 11 of the Law "On psychiatric care and guarantees of citizens' rights in its provision" and the conclusion of the Local Ethics Committee of the Medical Institute of VPO "Mordovia State University N.P. Ogareva" from 09.03.2011, protocol № 7. The first group of patients receiving traditional psychopharmacotherapy, was in a period of 20 days under the impact of the LED light source, the second – under fluorescent lighting conditions. The control group 1 consisted of 30 students-volunteers of the lighting faculty, engaged within 20 days under the conditions illumination LED light sources. Control group 2 consisted of 30 students working under the influence of other light sources. In all treatment groups by conventional methods studied parameters of endocrine status, and determine the total number of peripheral blood leukocytes, the number of segmented and band neutrophils (CR and SF IL).

Morphological properties of neutrophils was studied by NBT-test, and an index of neutrophil activation (IAS) in spontaneous embodiment, phagocytic activity of neutrophils was determined (AFS) against the latex particles, the adhesion of neutrophils. Statistical analysis was performed by conventional methods using a standard statistical software package "Statistics 6.0". [5] was studied the basic statistical characteristics: average, the error of the average. The significance of differences was calculated using the T – Student criterion in the case of equality of variances, modifications (T – test with separate variance estimates) – in the case of inequality dispersions. The critical value of the significance level was assumed to be 0,05 on a PC Authentic AMD. Identified patterns and connections between the groups studied parameters and attributes were significant at the probability of faultless prognosis  $p = 95\%$  or more [5].

### Results of research and their discussion

The study of the functional activity of neutrophils and dynamics of the plasma concentrations of pituitary hormone – thyroid stimulating, thyroid hormones – thyroxine and triiodothyronine, adrenal hormones – cortisol was performed in patients suffering from neurotic disorders. All subjects were divided into randomized groups into 2 random groups, receiving complex treatment as diazepam, used at a dose of 10 mg (2 ml of 0,5% solution) daily, once a day for 20 days mexidol 200 mg (4 ml 5% solution) intravenously with 200 ml of physiological sodium chloride solution during the first 10 days, followed by transfer to 100 mg (2 ml of a 5% solution) intravenously with 200 ml of physiological sodium chloride solution, 1 time per day to 20 days. Along with this applied immunocorrector timogen 0,1 mg daily intramuscularly first 10 days while using hyperbaric oxygenation, which was conducted at a pressure of 0,8–1,0 atmosphere, during the period of izopression of 40 min. HBO session held once a day for the first 10 days. During the observation period, patients of the group I were under the LED lighting conditions, the patients of the second group were under fluorescent lighting conditions. On admission to hospital in patients with various forms of neuroses were identified neutrophils with low adhesive activity, in reaction of "rosette assay" neutrophil adhesion was  $9,5 \pm 1,7\%$ , in contrast to the group of healthy donors, where adhesion was  $26,1 \pm 2,8$ . Indicators of activity of neutrophil phagocytosis, NBT test and activation of neutrophils index amounted to  $67,7 \pm 5,2$ ;  $31,3 \pm 5,4\%$  и  $0,51 \pm 0,03$  y.e. The index values of activation of neutrophils in patients with neurotic disorders exceeded those identified in donors –  $0,42 \pm 0,04$  y.e., that indicates a high intensity recovery of nitro-blue tetrazole in the "active" reaction against "oxidative burst" neutrophils and manifests the formation of larger lumps of formazan in the cell cytoplasm. In the study of hypophy-

sis hormones, thyroid gland, adrenal glands on admission revealed, that the level of hormones corresponded to age-matched normative values in both, the first and second groups of observations: thyroid-stimulating hormone was  $1,38 \pm 0,09$  and  $1,61 \pm 0,05$  nmol/l, free thyroxine –  $12,52 \pm 0,31$  and  $12,94 \pm 0,22$  nmol/l, with the exception of the stress hormone system implements – kortizol, the level of which has been increased –  $580,51 \pm 52,23$  and  $544,63 \pm 58,15$  nmol/l, respectively. LED and fluorescent light sources are used as lighting in carrying out daily stress tests during therapy with patients of neurotic disorders did not affect the dynamics of the functional activity of neutrophils. Increased adhesiveness of neutrophils to  $23,6 \pm 4,3$  and  $22,1 \pm 5,1\%$  when using LED and fluorescent lighting respectively, and decrease in the index of activation of neutrophils to  $0,21 \pm 0,07$  and  $0,29 \pm 0,05$  y.e., probably due to the influence of therapy by atioxidant meksidol, immunomodulator timogen, hyperbaric oxygenation on functionally and anatomically interconnected neuroimmune and endocrine mechanisms of stress-induced diseases. Under the effect of combined therapy in the conditions of the LED and the fluorescent lighting, the decrease in plasma cortisol concentrations was observed; with only under load tests with LED light sources cortisol was meet normal physiological range. In the first day of the survey a moderate adhesive activity of neutrophils was revealed in students, phagocytic function of neutrophils was  $53,7 \pm 6,4\%$ , the index of activated neutrophils was  $0,15 \pm 0,02$  y.e, which corresponds to the normative values of age. The use of LED lighting was accompanied by increased activity of neutrophils, thus, in spite of the significant differences with the figures of the first day of observation, the parameters studied were within the physiological norm. The index of neutrophil activity was  $0,29 \pm 0,01$  y.e., NCT was  $19,8 \pm 0,31$  y.e. Fluorescent light sources did not cause statistically significant differences in the functional activity of a group of students. In the study of hypophysis hormones, thyroid, adrenal in students revealed, that the first day of monitoring hormone levels corresponded age guideline values in both, the first and second groups of observation. Changes in hormonal status in the first group showed a decrease in thyroid-stimulating hormone, but it's level remained within the physiological values. The concentration of cortisol in students engaged under fluorescent lighting conditions, remains elevated relative to the level of healthy donors. In the context of the impact by LED lighting, cortisol corresponds to the level of healthy donors by the 15th day of observation.

### Conclusion

Optimizing impact of LED lighting seen in the restoration of the concentration of the hormone of the adrenal – kortizol, as in a student-volunteers and as in patients, suffering from neurotic disorders on a background of basic pharmacologic effects. Increased functional activity of neutrophils observed in terms of LED lighting, is regarded by us as a physiological response of ulcerative activation of the immune system. Thus, the morphological and functional parameters of the activity of neutrophils and endocrine responses can be used as prognostic markers of adverse external effects of optical factors.

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## AN INNOVATIVE APPROACH OF ADNEXIS TUMORS DIAGNOSTICS

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The biochemical and structural characteristic of biological liquids (serum of the blood, endometrial lavages and menstrual blood) at inflammatory diseases, benign and malignant adnexal tumors is given in the article. The results of work are a substantiation for clinical application of a method of wedge-shaped anhydration of biological liquids and finding in them the markers of oxidation stress – the carbonyl proteins with the purpose to increase the efficiency of early diagnostics of inflammatory adnexal diseases, benign and malignant ovarian tumors. The evaluation of structural features of morphological picture of endometrial lavages and menstrual fluid, as well as the showing the level of protein and lipid peroxide modification markers allow to reveal with the help of the given approach the forming tendencies of adnexal pathology at the preclinical stage.

**Keywords:** ovarian tumors, endometrial lavages, menstrual fluid, oxydative stress, peroxide protein oxidation, carbonyl proteins, structural microscopic peculiarities of biological liquids

In thirteen years an age-old anniversary of PAP-test, an effective and simple in usage method of revealing precancer and early carcinoma of uterine cervix, so called in honour of its creator, a Greek scientist Georgios Papanikolau, will be celebrated. Since 1943 the test has saved lots of women's lives and it would have saved more if the innovation, suggested by doctor Papanikolau in 1928, had been objectively and in good time evaluated by doctor's community instead of exposing to traditionally durable scepticism.

Nowadays the problem of screening precancerous and cancerous diseases of uterine body and appendages, which are increasing in population, is still unsolved. What do we know about it? Do we use the given diagnostic opportunities for preserving reproductive health and lives of our patients? It is the necessity of regular prophylactic measures, in the aspect of forming the considered diseases, that consists in high chances of their elimination just when they are early revealed.

As it is known, the problem of intensification and optimization of pre-hospital diagnostics largely determines the success of treatment and is one of its most important items. It is this approach that gives an opportunity for effective, preserving organs, treatment and thus at most saves reproductive abilities of women. It won't be an exaggeration to say that early and, furthermore, differential diagnosing diseases of inner genitalia remains one of the most complicated problems of gynecology. It gains peculiar significance while forming the concept of revealing precancer, early forms of endometrial cancer and cancer of uterine appendages, when there are no symptoms or they are very scarce and sizes of pathological tumors are minimal, and are not spread on other organs (as it is known, in such cases, treatment is more sparing and effective, and maximally favourable). WHO experts opinion of the absence of reliable screening programs of precancerous and cancerous pathology

of uterine body (endometrial cancer) and appendages should be also mentioned.

And, meanwhile, statistical data of Russian and foreign scientists convincingly testify not only steady increase of sick rate, but also "rejuvenation" of patients with benign and malignant hormone-dependent tumors of reproductive organs. This fact is explained not only by increase of an average life span, but also by the essential increase in population of such "diseases of civilization" as adiposity, anovulation, chronic hyperestrogenia, infertility, inflammatory diseases of uterine and appendages, and also by repeated "aggressive" obstetrical and gynecological manipulations [1, 2, 3]. That is why the necessity of forming a new approach to "active search" for patients with precancerous and early cancerous diseases of inner genitalia should be considered first of all from the position of elaborating the new screening test as one of the most perspective methods of their second prevention [4].

It is known that at cancerous growth mitochondrial oxygenation is forced out by glycolysis, more primitive way of energy supply. It is accompanied by active oxygen forms and is the basis of stimulating free radical oxygenation in the organism. During this process a state called «the oxydative stress» (OS) is developed and results in accumulating the highly toxic combinations leading to morphological disturbances of cells and tissues [5, 6, 7].

Free radicals hit all kinds of biological macromolecules, furthermore, the most studied are processes of lipids peroxide oxygenation. However, only active forms of oxygen also cause oxygenative destruction of proteins. It is considered that in a state of OS lipids are not attacked by the active oxygen forms first and foremost, but proteins of cells and biological fluids (BF) are. This process may also be the basic in structural and functional disturbances of the reproductive system organs, including the development of precancerous and

cancerous transformation of endometrial and ovarian tissues. However, it needs a considerable amount of pathologic deformation of molecular ingredients of a cell and, consequently, a prolonged time interval, in the final stage of which traditional cytologic and histologic methods of research are already available. In it lies one of the reasons of the displacement of the forming clinical picture and, consequently, the initiation of diagnostic measures of the disease for a later period.

It is important to note that structural changes of endometrium (E), as a hormone-dependent tissue, largely depend on the functional condition of ovaria. It is the endometrial tissue that reacts most sensitively upon the changes of homeostasis of the reproductive system organs, also including functional disturbances while forming tumors of gonades. According to it, we should point out the ability of a number of enzymes and their isoforms to accumulate during hyperplastic processes and cancer of endometrium in the apical parts of glandular cells, and then to secrete into the endometrial secretion [8]. It should be noted that besides blood and fragments of sloughing endometrial tissue, endometrial and endocervical secretion is also included into menstrual fluid (MF). By the drawn analogy the OS markers, among which the earliest is the carbonyl group of proteins (CGP), may also be found with the help of simple methods in MF and endometrial lavages (EL) of examined patients long before appearing manifesting symptoms of the disease.

Choosing MF (and EL), as an object of research, is explained not only by scientific curiosity (because they are poorly studied!), but also by the fact that once a month this BF in enough volume for examining (from 10 to 80 ml in healthy women) is spontaneously secreted from the uterine cavity and can be collected by patients themselves (into sanitary napkins or special caps) for the laboratory examination.

Traditionally morphological research in medicine is mainly concentrated on tissues and cellular elements whilst structural peculiarities of BF remain poorly studied. In this respect microscopy of the structures of a dry drop (facies), forming in BF when it turns into a solid state as a result of dehydration, is long-range. This new scientific trend was called «morphology of BF» [2]. The essence of the new method of diagnostics is in the fact that normally the microscopic picture of the examined drop of BF has more or less homogeneous structure and by slight influence of different damaging factors (oxidizing, toxic) the hydrate membranes of proteins change, and processes of molecular aggregation start.

In professors V.N. Shabalina and S.N. Shatohina opinion (1995, 2007), facies (F) is

a structural portrait of molecular correlation in BF which allows to put deep microprocesses on the macrolevel. A microscopic picture of F has structures which are characteristic for every kind of human BF, connected with peculiarities of physiologic and pathologic processes action in the organism.

Using technologies of the morphological analysis «Lithos-system» [10] one can observe even the earliest pathologic changes of molecular structures immediately, without «incubation period», which is necessary at cellular, organic and/or systemic levels. Therefore, the morphologic analysis of BF gives an opportunity for the earliest diagnostics of the developing pathologic process.

We offer a quantitative content analysis of the OS markers with a simultaneous defining structural microscopic peculiarities of the solid phase of MF and EL as a new diagnostic (and prognostic) approach to evaluating the state of inner genitalia in women of reproductive and (especially) perimenopausal ages.

The inner anatomical localization, complexity of the microscopic structures of neoplasms of the female gonades, indistinct borders between the neoplasms of a different maturation degree and diversity of their combinations – all these complicate the early revealing of ovarian tumors (OT) and hinder rational planning for patients treatment.

As it was already told, E tissue is extremely sensitive to the homeostatic changes of the reproductive system organs also including the increase of the OS markers content in EL, in particular, CGP by forming OT. Thus, according to D.L. Ovodenko et al. (2008), women from the control group with the normal ovarian structure had 0–1,9 ( $0,9 \pm 0,14$ ) nmol/mg. While increasing the index up to 2,0–3,5 ( $2,8 \pm 0,28$ ) nmol/mg in the majority of cases there were revealed benign tumors ( $p < 0,05$ ) and at 3,6–4,9 ( $4,8 \pm 0,25$ ) nmol/mg – malignant OT ( $p < 0,01$ ).

The CGP content in the MF of the patients with the benign ovarian tumors (BOT) was higher than the patients with chronic inflammatory processes of uterine appendages (CIPUA) and those from the control group had ( $p < 0,01$ ).

The microscopic picture of F of EL in the women from the control group was characterized by sharply shaped zone borders. In the majority of cases there were two zones – peripheral with radial cracks and central, containing crystals of salts, more rarely – straight radial cracks as a prolongation of the peripheral zone cracks (Fig. 1). Besides that, in 24,8% of the cases in F of EL of the women from this group appeared the third intermediate zone, located between the two above mentioned zones, containing three-rayed cracks.

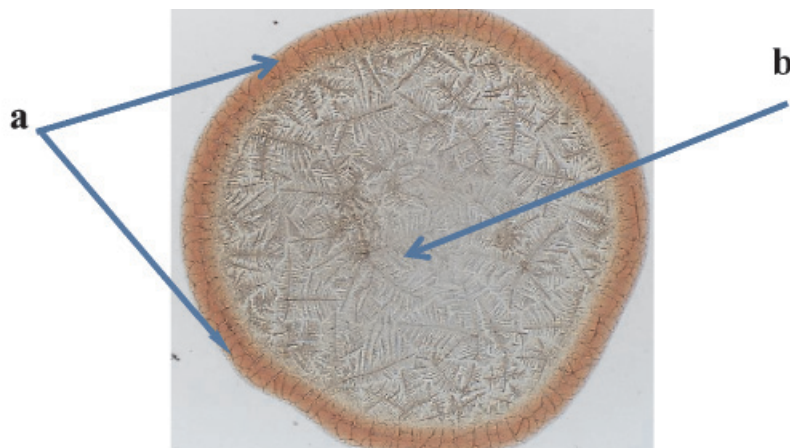


Fig. 1. Facies of endometrial lavage of reference group patient ( $\times 10$ )  
a – peripheral zone with radial cracks; b – salt area

In the patients with CIPUA and during the aggravation of the process, the area sizes of three-rayed and radial cracks didn't reliably differ from the analogous indexes of the women from the control group. However, in these cases «tongue» structures (markers of inflammation), «twirls» and wisp blocks (markers of hypoxia) appeared in the picture of F.

F of EL in the patients with benign ovarian tumors and ovarian cancer were rather different in their structure from those, which the women from the control group had. Facies zones of EL remained in the patients with benign ovarian tumors of all age groups, moreover, in 68,4% of cases they have already had the zone with three-rayed cracks (Fig. 2).

In those patients, who had ovarian cancer, the area of the three-rayed cracks zone

on the surface of F markedly enlarged up to  $2,2 \pm 0,10 \text{ mm}^2$  (Fig. 3), being reliably different from the same in the control group ( $p < 0,01$ ) and in the group of patients with benign ovarian tumors ( $p < 0,05$ ). The area of the peripheral zone with radial cracks was  $6,1 \pm 0,42 \text{ mm}^2$  and in size it wasn't different from that, which the women from the control group had [11].

The obtained results testify that the microscopic picture of F of EL and MF has clear and distinctive peculiarities in patients with benign, frontier and malignant ovarian tumors. Including methods of structural and biochemical analysis of EL and MF into a diagnostic complex in the patients from «risk groups» of the OT development will allow to increase sensibility and to rise specificity of the research [12].

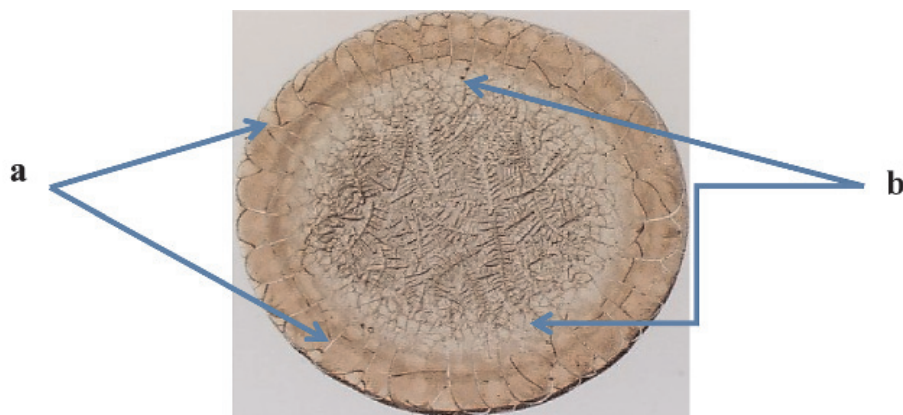


Fig.2. Facies of endometrial lavage of patient with benign OT, ( $\times 10$ )  
a – peripheral zone with radial cracks; b – three-beam cracks

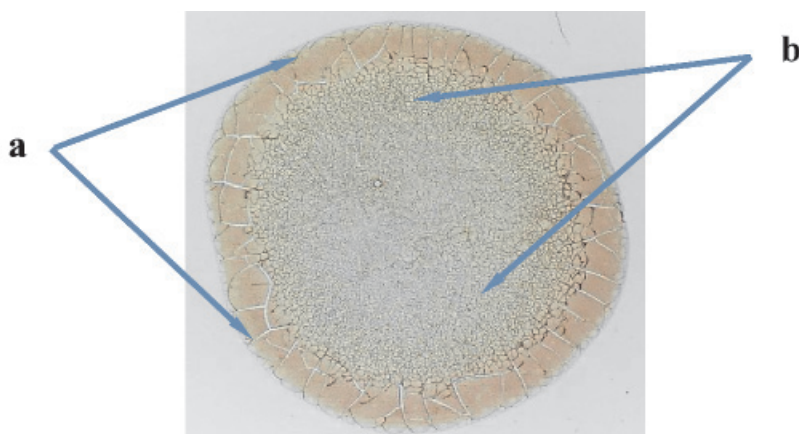


Fig. 3. Facies of endometrial lavage of patient with malignant OT, ( $\times 10$ )  
a – peripheral zone with radial cracks; b – three-beam cracks

An important advantage of the offered method of diagnostics is noninvasive and atraumatic collecting of the researched material, the possibility of multiple repeating the research in antenatal clinics, making analysis in laboratories of Health institutions. The obtained results confirm the possibility of revealing ovarian cancer at early stages of its development when organ-preserving surgery becomes the most realistic and, thus preserving reproductive health of women.

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## EUROPEAN AND BUDDHIST ETHICS IN THE CONTEXT OF "OPEN SOCIETY" CONCEPT

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In this paper are analyzed the relationship of the degree of "openness" of society, its level of "democracy" and the rationalism of the various spheres of public life in Popper's conception of "open society". While analyzing the contemporary society, the mainstream criticism of world capitalism system by G. Soros was taken into account. The comparative analysis of "Western" values, based on the ideal of rationality and articulated by K. Popper, along with corresponding values of the Eastern civilizations (notably the Buddhist civilization) was taken. Estimated contribution to Buddhist logicians in the formation of the "East" of the ideal of rationality. Particularly, the economic dimension of the Buddhist way of life and ideological component of geopolitical potential of Buddhist civilization, its positions in intercultural and inter-civilization dialogue were examined. The article concludes that the corresponding values and ideals of rationality, in both Western and Eastern civilizations could co-exist together.

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**Keywords:** the concept of "open society", ideal of rationality by K. Popper, values of the Buddhist civilization dialogue of civilizations

The main object of study in this paper is the conception of "open society concept" and its correlation with ethics in European and Buddhist philosophy. First, let's view what is the problem of an "open society". A. Bergson was the first one to formulate the problem of "open" and "closed" societies. According to the French philosopher society's openness is the result of creative evolution of the personality aimed to merge with the object of cognition on the intuitive basis. The intuitive vital urge guides the cultural innovations which break the shell of "close societies". The "close society's" mind devoid of critical reflection considers senseless any innovation affecting its foundation. Thus the problem of "opening" society comes to "introducing" the rationalistic ideals into its values. It was exactly this problem that was realized by K. Popper who understood the transition to open society as the intellect acquiring the ultimate role in the life of human societies. He believed this role was in criticizing and renovation of all the phenomena of social life. According to K. Popper, the member of "open society" counts only on the judgment of intellect.

Open society is regarded by K. Popper and his supporters as an ideal model of social life, its best possible design that should be the goal of all people who believe in a possibility of rational decisions based on scientific knowledge. According to Popper, democracy, and the one of the western type at that, is the best form of the state system which makes open society possible.

Open society is devoid of hierarchy and authority set once and for all, these is flexible and interchangeable since everyone in principle is able to occupy any social position. It makes

archaic clans and communities monopolizing whole branches of administration and professional activity impossible. It is devoid of a taboo system and scrupulous code of conduct. When comparing open society with the close one Karl Popper notes that the latter is much dependant on personal relations among people since the social function there is as a rule inseparable from a concrete person beginning from a monarch or dictator elected by no one. According to Popper open society's design is more abstract, that is impersonal. K. Popper identified the threat to open society in totalitarian ideology under the disguise of revolutionary striving for the future and traditionalistic return to the past. Analyzing the views of Heraclitus, Plato, Hegel, and Marx Popper revealed their effective role in fighting the openness of the social system in order to preserve the interests of a definite party or a clan of oligarchs.

The "entry" into "open society" and struggle for its principles – territorial openness, democracy, individualization, which started in the 5th century B.C. and resulted in the conflict between Athens and Sparta, are still important nowadays under the conditions of existing various political traditions and various degrees of political systems' openness. There is a stable correlation historically formed in the western political and social thought between the degree of society's openness and its degree of democratization which is carried out alongside with rationalization of the majority of the political life spheres. But can such correlation be universal for all other societies challenging the world's openness in the social spheres of information, economics, culture and others? The principle of openness has become universal. But its correlation with democracy turned out

extremely complex, both in the developed and developing societies. It seems that the transition of society from one level of openness (for instance associated with the recognition of the market's role only) to another level (assuming for example a search for some equilibrium among the interests of society, business and the state) is up to society itself. The principle of openness may destroy or erode the social system or on the contrary give it a new impetus boosting the spiritual and intellectual potential in order to let the system reach a new level of development.

The historical events of the ancient epoch, we are going to dwell on, symbolize the "beginning" of a new social reality with consideration to man's needs and assumption of his critical reflection of the surrounding world, society and state. We will note once more that the first historical "entry" into open society associated with classical antiquity and the times of rule by strategist Pericles may be regarded as a hypothesis or a "clarifying myth" like those proposed as the ground for the "agreement" theories of the state's origin. Some agreement once taking place marked the birth of the state as a "mortal deity" created by man. Certain mythifying and idealizing of democracy and openness of Pericles time's society marks only the first impetus towards that new state of openness which may be associated with the new form of ruling – democracy and the new strategy of governing the social world. There is no surprise that the focus of the analysis of open society, in a sense still remaining an ideal model, shifts. And such historical shifting more and more clearly marks a desertion from the local historical confrontation "Sparta – Athens" and transition to a more global and multifold confrontation of various traditions, opinions, discourses and social practices.

J. Soros, a well-known financier and student of Karl Popper, continuing the tradition of the "open society" research anxiously states new dangers to "open society" mostly coming from the "dynamic misbalance" caused rather by the informational war and postindustrial expansion than totalitarian ideology. A society that proved unable to accept the challenge of openness becomes unstable and dangerous. Soros interprets "dynamic misbalance" as a clear disparity between the dynamics of social changes and man's ability to adequately comprehend and react to them. Instability and chaos, as Soros sees it, come from the "market fundamentalism" which cannot yet be restricted the world political system. Numerous unpredictable results to open society may be expected from the societies that having made first steps towards democracy have not yet developed adequate ways of comprehending and controlling social dynamics.

At the same time democratic traditions and institutions have been forming not only in the West but also in the East. The same can be said of science and rationalistic philosophy playing a decisive role in Popper's concept. A number of crucial principles of Buddhist civilization forming throughout the millennium appear to be quite corresponding to the model of open society. The principles of universal humanism and compassion as the staple of the world; the principle of universal responsibility for forming social institutes and organizations aimed to solve problems common to all people; the principle of tolerance and common ethical direction of all world religions can be attributed to such principles.

Buddhism represents a system of spiritual-ecological values alternative to the ideology of the modern consumer society. Instead of the idea of man's rule over nature and paradigm of man's exceptionality, Buddhism brings forward the idea of the absence of personal "Self", inner self-sufficiency of every living being, instead of the necessity to conquer nature – the "ahimsa" principle – that is abstaining from doing harm to all living things; instead of the ideology of political violence – the concept of a natural non-violent way of development; instead of alienated values – genuine happiness (nirvana).

The social ideal of Buddhism is a harmonious society with spiritual and ecological priorities established. The humanistic ideal of Buddhism is a person satisfied with life in society and living in harmony with nature. Buddhism encourages self-restriction and social solidarity, justice and equality, pure thoughts and deeds. This is a powerful spiritual tool liberating us from human egoism and consumer ideology.

The economic ideal of Buddhism is small energy (and material consumption) with results satisfying man. The Buddhist lifestyle would seem incredible to an economist due to its unbelievable rationality. Relations among people in Buddhist civilization controlled mostly by Buddhist values and ideals cause a specific, as a western researcher may see it, economic activity within which there takes place distribution of religious merits involving not people only but all living beings as well. As M. Spiro has noted, the mechanism of such distribution involving both spiritual and material values (from 30 to 40 percent of the whole gross product) becomes an integrating factor of social life. This fact has also attracted attention of Trevor Ling who considers negative assessment of Buddhism by Max Weber wrong since the Buddhist economic model cannot be judged from the viewpoint of protestant individualism and Buddhism cannot describe as a "religion

of individual salvation". The implementation of an optimum consumption model is the main condition for sustainable development of man.

From the Buddhist viewpoint, economic development should promote the development of human qualities rather than material wealth. Today it is absolutely clear that economic growth by itself will not lead to sustainable development of the world. There is a need in global changes based on a new spiritual paradigm. According to Buddhism spiritual evolution of the individual is a basis of society's sustainable development. When we have a spiritual harmony within us we can live in piece with society. Moreover, the spiritual influence can involve the whole environment. In a word, the world originates within each of us.

Buddhist civilization emerged as an alloy of the elements of numerous preceding cultures and civilizations, experience of many generations of various ethnoses. The peculiarity of Buddhist civilization's development lies in the fact that to a considerable extent such experience was selected quite purposefully, and the further development was greatly influenced by philosophic reflection. Even in those cases when logic was deliberately limited or even denied, the integrity of Buddhist culture, Buddhist knowledge, deliberate and responsible attitude to reality was not broken. Buddhist civilization lies "in between" since in most cases it acts a close-to-perfect mediator among other cultures and civilizations, various ethnic groups and peoples.

The historical experience of Buddhist civilization is of interest as the mankind tries to understand its problems and find an optimal way of development. At present the major part of the civilized mankind finds itself approaching a crisis. If the present-day trends of the mankind's development remain for this quarter of the century, a sharp economic decline, depletion of natural resources, overpopulation and a global ecological catastrophe are predicted. Besides, there is a prediction of intensified struggle between the world's leading ideologies, aggravation of religious and ethnic conflicts and a clash of civilizations in perspective. Many consider this to be the result of those regularities that make the basis of the very phenomenon of civilization. Twenty five centuries of Buddhist civilization's existence vividly prove that it is possible to live in equilibrium with the natural environment, in piece with the surrounding cultures, scientific progress, to remain stable moral values and norms, maintain high educational standards. Buddhism's tolerance to the cultural and religious values of the others, its readiness to assimilate the best from the world culture let it gain the status of a global universalistic civilization spreading

beyond the state, national and confessional borders. Buddhism lies beyond the presupposed struggle between the other major civilizations since it does not strive to control the shrinking natural resources or to politically or ideologically rule the world. If the directions and ideals of the mankind's development model for the twenty first century, recommended by the present-day global problems experts are compared to the basic economic, ecological, cultural and spiritual parameters of Buddhist civilization, then it will appear that many of these ideals have already been put into practice by many generations of Indians, the Chinese, Japanese, Koreans, Tibetans, Mongols, Buryats, Kalmyks, Vietnamese, Khmers, Thais, Singhalese, Burmese, etc. Buddhism does not claim to be exceptional and is wide open to philosophic dialog, and this makes it still more appealing to intellectual elite as a neutral ideological field opening possibilities for various contacts at all levels. Fairly strict moral norms of Buddhism presume a possibility and necessity to carry out that what is called inalienable rights of the individual and responsible social conduct. To some extent they correspond to the ideals of the western democracy but unlike the latter they remain the collectivist ideological trends and condemn individualism.

As an example of the typical Buddhist civilization could be examined early medieval and medieval Japan. It is remarkable that the first constitution of Japan ("Constitution of 17 articles"), compiled in 604, based mostly on the principles of Buddhist ethics. Originally it's compilation was attributed to Prince Shōtoku (Shōtoku-taishi).

The Prince Regent Shōtoku (Shōtoku-Taishi) (574–621) is as inseparably linked with Buddhism, as the Indian emperor Ashoka or the Tibetan king Songtsän Gampo. He also was considered as an author of the first code of laws, and the patron of the Buddhist Sangha, who led the construction of temples. In addition, first treatises on Buddhist philosophy in Japan (Sangyo Gishō) were also attributed to Prince Shōtoku. It is necessary to pay attention on one important ethical category, which is constantly present in the writings of Prince Shōtoku. This is the concept of "virtue" (*zen* 善). Analyzing this concept, it is noticeable that for Shōtoku-Taishi the constant practice of virtue is more important than good karma and even prosperity. Prosperity for him serve only as an opportunity to carry out good deeds for the common weal of all sentient beings. The ultimate goal of this practice is the obtaining of the Buddha's state. The concept of "virtue" as the foundation of a harmonious society also presents in the "Constitution of 17 articles". For example in the article II is said: "Sincerely revere

to the Three Treasures (*sanbō* 三宝). The Three Treasures are the Buddha, the Dharma and the Sangha. Among the people are less notorious scoundrels. But even those worship the teachings of Buddha. The Buddha's teaching is a noble law, which avoids evil and seeks good, the highest object of worship in all countries". This passage shows the desire of the author to regulate the behavior of people with virtue. The "Three Treasures" could not only save the misguided people, but also make their daily lives full of meaning. In article X is written: "It is necessary to avoid anger in your heart and thoughts. There are times when there is a reason to be angry at the other, but not always the accusing person is right and not always on the accused one lies fault. Mostly guilty are both persons. Actually, all people are the same and it is impossible to find out the cause of fault. If another person is angry, it would be better to admit that he is wright".

It is evident that prince Shōtoku's philosophical views were innovative for that time. Their uniqueness lies in the fact that the man who was considered to be the founder of the Japanese state system, in fact was Buddhist devotee and considered Dharma as a moral and ethical code. One of the contribution of Prince Shōtoku in Japanese Buddhism consists of that he was founder of the concept of Buddhist ethics in early Japanese Buddhism. This concept later was developed by Doshō (629-700), the founder of East Asian Yogācāra school, and Saichō the founder of Tendai school already in the Heian period. Due to this concept in the early Japanese Buddhism formed the ideological currents, focused mostly on the moral image and ethics behavior of followers of Buddhism. The Buddhist ethics of Shōtoku-taishi, combined with original Shinto ideas, also stimulated the development of traditional Japanese culture, acknowledged as one of the most significant phenomenon in the world cultural inheritance. It could also be one of the reason

how the Japanese preserved their traditional culture till nowadays in the transforming world of modern globalization.

By the dialog between civilizations we imply such interaction of various social-cultural worlds when each of them understands the need to reconsider its basis and prospects for the future in the presence of the other world and to treat the latter as a further extension of its own practice. The dialog of civilizations implies equality of peoples and their positive cooperation. The dialog is only possible when each of its participants respects the others and treats them as equal. The definite forms of globalization during future evolution depend on the degree of development of the strategic partnership among various countries, social powers and local civilizations. Here various interests and values are compared. And they can be united by an idea common to all of the mankind. Such an idea, as we see it, can be the one of sustainable and balanced development, that is an idea of long-term (eternal in perspective) existence of the human civilization in harmony with nature, the natural environment and cosmos.

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# DETERMINATION OF STRESS CONCENTRATION FACTORS FOR THE MAJOR STRUCTURAL ELEMENTS OF THE BEARING BLOCK FIXED OFFSHORE PLATFORMS IN CONDITIONS OF LONGITUDINAL TENSILE FORCES, COMPRESSION, BENDING AND TORSION UNDER UNIFORM CORROSION IMPACT

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This article analyzes the changes in the stress state of the structural elements of the support unit fixed offshore platforms, depending on the corrosive effect. To study the dynamics of corrosion processes, the authors identified a cross-section modulus in bending and torsion as the main characteristics influencing the stress state of the platform. As a result, the formula was calculated to assess the changes of stress state of the elements of the reference block depending on the time of operation

**Keywords:** concentration, bearing, fixed offshore platforms, tensile forces, compression, bending, torsion

Analyzed in the third chapter of the stress state of the columns move to the calculation of stress concentration factors arising from these forces and loads. As it was shown earlier, all current strength and stress in assessing the state of stress of the support elements of the unit it is advisable to lay axes. And these forces caused by normal and shear stresses have to be considered depending on the shape of their action (compression, stretching, bending and torsion).

In the calculations, it should be noted that the elements of the platform are in three areas: water area; splash zone; submarine zone;

Given that, according to [13] the rate of corrosion processes occurring on the columns, is made in accordance with Table 1.

**Table 1**

The values of corrosion rates, depending on the areas of marine corrosion

Zone marine corrosion	Corrosion rate, VR mm/year
	Vertical Stand (column)
Underwater	0,12
aC wetting	0,16
Above-water	0,10

We calculate values for determining the values of stress concentration factors for the columns supporting the SME block from the longitudinal compressive or tensile force. Define the following initial values (Table 2.)

Consider a column diameter of 720 mm and a wall thickness in the initial period of operation of 20 mm. We determine the magnitude of the stress concentration factor  $K$  based on

the fact that the longitudinal compressive force  $N$  (down of its own weight, buoyancy aqueous medium, the weight of equipment fouling, etc.) slightly depends on reducing the diameter of the column.

**Table 2**

The initial values

The name and the dimension	Designation
External Diameter of the column, mm	$D$
The internal column diameter, mm	$d$
Time, years	$t$
The longitudinal compressive force, kN	$N$
Cross-sectional area, mm <sup>2</sup>	$F$
The nominal compressive stresses from longitudinal forces, MPa	$\sigma_0$
The compressive stress over a time period of operation $t$ , c considering corrosive, MPa	$\sigma_t$
Stress concentration factor	$K$

Viewed element is in the underwater area, the corrosion rate in this case, according to Table 2 0,12 mm/year.

Stress concentration factor is equal to  $m$ :

$$K = \frac{\sigma_t}{\sigma_0}. \quad (1)$$

Compressed or stretched nominal stress, according to [10]:

$$\sigma_0 = \frac{N}{F}, \quad (2)$$

where  $\sigma_0$  – compressed or stretched nominal stress;  $N$  – compressive or tensile force;  $F$  – sectional area of the pipe.

Given the formula determines the cross sectional area, we get:

$$\sigma_0 = \frac{4 \cdot N}{\pi \cdot (D^2 - d^2)}, \quad (3)$$

where  $n D$  and  $d$  – External and inner diameters of the component of the support block and the other values are the same as in (2)

Since the surface corrosion in the offshore field leads to a thinning of the outer surface of the structural elements of SMEs, reducing the value of the outer diameter  $D$ , type the value

$$x = D - 2Vt, \text{ mm},$$

which takes into account the rate of corrosion, and thus obtain the formula to calculate the compressive stress in the period  $t$  years:

$$\begin{aligned} \sigma_t &= \frac{4N}{\pi([D - 2 \cdot V \cdot t]^2 - d^2)} = \\ &= \frac{4N}{\pi(x^2 - d^2)}. \end{aligned} \quad (4)$$

Substituting formula (1) and 2) in (3), we obtain the stress concentration factor for the period of operation of 5 years:

$$\begin{aligned} K_5 &= \frac{(D^2 - d^2)}{(x^2 - d^2)} = \\ &= \frac{(720^2 - 680^2)}{(720 - 2 \cdot 0,12 \cdot 5)^2 - 680^2} = 1,031. \end{aligned} \quad (5)$$

Therefore, we can conclude that the 5-year increase in the nominal stress 1,031 times.

Similarly we calculate the stress concentration factors for ten, fifteen, twenty, twenty-five, thirty years and we get the following values:  $K_{10} = 1,065$ ;  $K_{15} = 1,101$ ;  $K_{20} = 1,14$ ;  $K_{25} = 1,181$ ;  $K_{30} = 1,225$ . Proceeding similarly, given investigate column located in the variable wetting corrosion rate in this case is 0,16 mm/year (Table 2). The analysis of materials project revealed that the column is usually carried out from the pipes 720h16, 720h20, 720h25, 1020h20, 1020h25 and 1020h30. We calculate stress concentration factors in a longitudinal stressed state and the data are summarized in Table 3.

Analyze the state of stress caused by the bending stress on the wave load (in-depth analysis, see chap. 3). Guided by the above considerations, we derive a formula for estimating the stress concentrations for columns in a corrosive effect under the action of wave loads and the induced bending moment.

**Table 3**

Stress concentration factor as a function of operating time for the columns of various diameters and wall thickness in a uniform surface corrosion under the action of compressive and tensile forces

Time, years	Underwater area	aC wetting	Above-water zone
<b>Column diameter of 720mm and a wall thickness of 16mm</b>			
5,00	1,04	1,05	1,03
10,00	1,08	1,11	1,07
15,00	1,13	1,18	1,11
20,00	1,18	1,26	1,15
25,00	1,24	1,32	1,19
30,00	1,30	1,42	1,24
<b>Column diameter of 720mm and a wall thickness of 20mm</b>			
5,00	1,03	1,04	1,03
10,00	1,07	1,09	1,05
15,00	1,10	1,14	1,08
20,00	1,14	1,20	1,11
25,00	1,18	1,24	1,15
30,00	1,23	1,31	1,18
<b>Column diameter of 720mm and a wall thickness of 25mm</b>			
5,00	1,03	1,03	1,02
10,00	1,05	1,07	1,04
15,00	1,08	1,11	1,07
20,00	1,11	1,15	1,09
25,00	1,14	1,20	1,12
30,00	1,17	1,25	1,14
<b>Column diameter of 1020mm and a wall thickness of 20mm</b>			
5,00	1,03	1,04	1,03
10,00	1,07	1,09	1,05
15,00	1,10	1,14	1,08
20,00	1,14	1,19	1,11
25,00	1,18	1,26	1,15
30,00	1,22	1,29	1,18
<b>Column diameter of 1020mm and a wall thickness of 25mm</b>			
5,00	1,03	1,03	1,02
10,00	1,05	1,07	1,04
15,00	1,08	1,11	1,07
20,00	1,11	1,15	1,09
25,00	1,14	1,20	1,11
30,00	1,17	1,24	1,14
<b>Column diameter of 1020mm and a wall thickness of 30mm</b>			
5,00	1,02	1,03	1,02
10,00	1,04	1,06	1,04
15,00	1,07	1,09	1,05
20,00	1,09	1,12	1,07
25,00	1,11	1,16	1,09
30,00	1,14	1,20	1,11

Since the surface corrosion in the offshore field leads to a thinning of the outer surface of the structural elements of SMEs, reducing the value of the outer diameter  $D$ , type the value

$$x = D - 2Vt, \text{ mm},$$

which takes into account the rate of corrosion, and thus obtain a formula for the calculation of longitudinal bending stress in the period  $t$  years:

$$\begin{aligned} \sigma_t &= \frac{32M(D-2V \cdot t)}{\pi([D-2V \cdot t]^4 - d^4)} = \\ &= \frac{32Mx}{\pi(x^4 - d^4)}. \end{aligned} \quad (6)$$

Then the formula for determining the coefficient of stress concentration during the operation period  $t$  years will look:

$$K_t = \frac{x}{D} \cdot \frac{(D^4 - d^4)}{(x^4 - d^4)}. \quad (7)$$

Let us analyze the shear stresses arising from the action of torque. In the case of wave action on the horizontal elements of the load supporting block ICP, a torque acting on the column.

Nominal shear stresses arising from torsional are:

$$\tau_0 = \frac{M_{kp}}{W_p} = \frac{16 \cdot M_{kp} \cdot D}{\pi \cdot (D^4 - d^4)}. \quad (8)$$

Since the surface corrosion in the offshore field leads to a thinning of the outer surface of the structural elements of SMEs, reducing the value of the outer diameter  $D$ , type the value

$$x = D - 2Vt, \text{ mm},$$

which takes into account the rate of corrosion, and thus obtain the formula to calculate the shear stresses in the period  $t$  years:

$$\begin{aligned} \tau_t &= \frac{16 \cdot M_{kp} (D - 2V \cdot t)}{\pi([D - 2V \cdot t]^4 - d^4)} = \\ &= \frac{16 \cdot M_{kp} x}{\pi(x^4 - d^4)}. \end{aligned} \quad (9)$$

Hence we get the formula for determining the coefficient of stress concentration during the operation period  $t$  years:

$$K_t = \frac{\tau_t}{\tau_0} = \frac{x}{D} \cdot \frac{(D^4 - d^4)}{(x^4 - d^4)}. \quad (10)$$

As you can see, the resulting formula describes the concentration of bending stress coincides with the formula describing the stress concentration in torsion. Analysis calculated values KKN showed that their value in cases of the forces of compression, tension and bending or twisting moments are different from each other in the same conditions, no more than 2 %, which allows them to combine in the general formula.

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*Materials of Conferences*

**SYSTEM MODERNIZATION  
OF ART EDUCATION IN MODERN  
SOCIALLY – ECONOMIC CONDITIONS  
OF THE REGION**

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The key issues of the article are problems of modernization of regional system of continuous art education, organizational, legal and economic reform of art education.

Russian Federation's Federal Law № 273-FZ of December 29, 2012 "About education in the Russian Federation" [1] fixed the status of additional education of children (hereinafter – DOD) and formulated the responsibility of subjects for children development, ensure equal access to educational resources, update of the content and technology, infrastructure development according to the changing needs of the population and new social, cultural and economic development of regions.

To resolve the existing distinctions between territorial subjects of the Russian Federation in the sphere of DOD, to ensure the unity of educational space according to key issues of a state program of the Russian Federation "Development of education for 2013–2020" [2], we need to use methods for alignment and stimulation of development and strengthening of institutional capacity according to target approach.

President's decrees of the Russian Federation formulated tasks of increase in coverage of DOD to 75% by 2020. Also it provides that up to 50% of expenditures for these purposes will be funded from the Federal budget [3].

With adoption of law № 273-FZ remained not settled questions of financial security by DOD at children's schools of arts (hereinafter – CAS) in the sphere of culture. According to the current legislation CAS are not provided with equal rights with educational institutions that implement additional educational programs in the field of education: to receive public and free education, to receive subventions to local budgets in the amount necessary for the full implementation of the educational programs in the arts. In accordance with the order The Russian Federation's Ministry of Finance № 31H of March 18, 2013 the costs of the maintenance and support of the educational process CAS related to the institutions of extracurricular work with children.

With the amendments to The Budget Code of the Russian Federation (regarding the introduction of a new sub-classification of budget expenditures "Additional education" in the "Education") since 2016 will be gradually solved the issues of improving the methodology of budget expenditures in the field of culture.

Today the scope of DOD is one of the fastest growing segments of the market "educational services" with the growing volume of investments from the private sector, a high level of innovative activity that allows us to consider the transformation in this area as a priority for innovative development of the country.

In 2016 the Ministry of Education of the Russian Federation plans to radically change the system of DOD. Therefore, how this problem will be solved, will depend on future DOD activities in the field of culture.

Maintaining the network of art schools is an important task, focused on the preservation and development of national heritage, continuous traditionally system of continuous art education "school – college – university", maintaining the highest level of professional art in Russia.

Projects Federal Laws "About Culture in the Russian Federation" (2015), Development program of Russian musical education for the period from 2015 to 2020 are directed on the solution of priorities in the sphere of culture and on elimination of gaps and contradictions in the current legislation.

According to reforms of the Project of the Ministry of Culture of the Russian Federation "Fundamentals of the state cultural policy" we need correction of functions of a set of the ministries and departments, their powers and zones of responsibility, regulations which govern the relations in the sphere of culture and cultural policy, and also the conceptual, organizational, institutional and methodical party of regulation of the relations in these spheres.

According to the Russian Federation's reform project of the Ministry of Culture "Fundamentals of the state cultural policy" [4] we need to adjust the functions of many ministries and departments, their powers and responsibilities, regulatory legal acts that regulate relations in the sphere of culture and cultural policy, as well as the conceptual, organizational, institutional and methodological side of regulation in these areas.

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*Materials of Conferences*

**INTEGRATED RESEARCH POLLUTION  
BY HARMFUL SUBSTANCES SOIL  
AND WATER ACTIVITIES OF THE REGION  
OGM «ZHAYIKOIL»**

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The main elements of the relief, at different distances from pollution sources, on the border of SPZ to assess the pollution and on the border of the residential area were selected soil samples.

The results of analyzes on the contents of trace elements in soil, are shown in Tables 1 and 2. Analysis of the influence zone OGM «Zhayikoil» on the soil of residential settlements are shown in Tables 3 and 4 [1–5].

Observation of the state of water in the region is carried out in 2 directions: since 1991—observation of surface water, and since 1994 in addition – observation of groundwater [1–5].

Sampling point located approximately 10 km from the coastline. Because of the low slope of the Caspian Sea in the sampling points of the depth does not exceed 1 m. This defines the pollution effects on flora and fauna in the coastal area. If during the summer due to the wind and the movement of water pollution in the coastal areas oilfield naturally neutralized, in the autumn-winter period to living organisms creates unfavorable conditions.

**Table 1**

The chemical analysis of the soil. Macrocomponents

Number of laboratory	Number of sample order	The location of the sampling	Macrocomponents, mg/kg of soil				
			pH	CO <sub>3</sub>	HCO <sub>3</sub>	SO <sub>4</sub>	Cl
165	1	SPZ OGM (north)	6,5	not found	936,0	154,0	10,9
166	2	SPZ OGM (south)	6,4	not found	696,0	256,0	10,2
167	3	SPZ OGM (west)	6,2	not found	366,0	20,0	11,8
168	4	SPZ OGM (east)	6,3	not found	329,0	14,0	12,0
169	5	Nuclear test site (north)	6,8	not found	489,0	1951,0	14,9
170	6	Nuclear test site (south)	6,5	not found	712,0	2934,0	15,8
171	7	Nuclear test site (west)	6,4	not found	670,0	15,0	10,0
172	8	Nuclear test site (east)	6,9	not found	1653,0	9,8	14,8
173	9	Balgimbaev village	6,6	not found	305,0	10,0	15,2

**Table 2**

The chemical analysis of the soil. Heavy metals and petroleum products

Number of laboratory	Number of sample order	The location of the sampling	Various components, mg/kg of soil								
			Cr	Ni	Zn	Cu	Pb	Cd	Fe overall	Mn	oil products
1	2	3	4	5	6	7	8	9	10	11	12
165	1	SPZ OGM (north)	0,7	3,6	less than 0,1	2,4	0,010	found	9,3	30,0	16,8
166	2	SPZ OGM (south)	0,4	3,4	less than 0,1	2,6	0,010	not found	1,0	10,0	not found
167	3	SPZ OGM (west)	0,3	3,4	less than 0,1	0,9	foot-prints	not found	2,0	14,9	18,5
168	4	SPZ OGM (east)	0,3	2,7	less than 0,1	1,2	0,004	0,003	8,0	18,0	19,3
169	5	Nuclear test site (north)	3	3,4	less than 0,1	2,0	foot-prints	0,001	0,3	10,9	39,2
170	6	Nuclear test site (south)	3,2	3,7	less than 0,1	2,9	0,003	not found	0,6	10,0	not found

End of Table 2

1	2	3	4	5	6	7	8	9	10	11	12
171	7	Nuclear test site (west)	2	2,8	less than 0,1	2,0	0,004	0,005	3,5	38,0	12,4
172	8	Nuclear test site (east)	1,2	3,8	less than 0,1	1,3	0,001	found	1,2	58,1	not found
173	9	Balgimbaev village	less than 0,1	2,4	less than 0,1	1,9	0,004	0,003	8,9	12,0	not found
MPC, mg/kg			6	4	23	3	32	1			1000

Table 3

Results of chemical analysis of soils inhabited villages. Macrocomponents

Number of laboratory	Number of sample order	The location of the sampling	Macrocomponents., mg/kg of soil				
			HCO <sub>3</sub>	CO <sub>3</sub>	Cl	SO <sub>4</sub>	pH
158	T-1	village	305,0	not found	14,8	20,0	5,7
159	T-2	village	366,0	not found	12,3	20,0	7,2
160	T-3	outside the village	427,0	not found	10,6	30,0	6,5

Table 4

Results of chemical analysis of soils inhabited villages. Various components

Number of laboratory	Number of sample order	Various components, mg/kg of soil								
		Cr	Ni	Zn	Cu	Pb	Cd	Fe общ.	Mn	Н/п
158	T-1	not found	1,2	not found	3,0	0,01	not found	6,5	91,1	175,1
159	T-2	not found	0,9	not found	1,6	н/о	not found	6,8	19,1	not found
160	T-3	not found	0,3	not found	2,1	0,03	not found	2,1	90,0	not found

Table 5

The chemical analysis of the water. Macrocomponents

Point	The location of the sampling	pH	Concentration of chemical substances, mg/lit				
			HCO <sub>3</sub> <sup>-</sup>	CO <sub>3</sub> <sup>-</sup>	NO <sub>2</sub> <sup>-</sup>	NO <sub>3</sub> <sup>-</sup>	SO <sub>4</sub> <sup>-2</sup>
I quarter of 2003							
1	Drinking water wells	7,2	591,7	not found	0,05	3,5	290,6
2	The river at the entrance of the SPZ	7,0	335,5	not found	0,15	0,5	286,0
3	River at the outlet of the SPZ	7,3	384,3	not found	0,15	0,7	240,0
4	Water intake № 1	7,1	128,1	not found	0,07	0,6	20,0
5	Water intake № 2	7,4	134,2	not found	0,01	0,5	26,2
II quarter of 2003							
1	Drinking water wells	6,9	353,8	not found	0,01	8,6	390,0
2	The river at the entrance of the SPZ	6,8	164,2	not found	0,01	0,2	184,0
3	River at the outlet of the SPZ	6,9	195,2	not found	0,01	0,2	204,0
4	Water intake № 1	6,7	51,5	not found	н/о	0,0	17,0
5	Water intake № 2	6,4	79,9	not found	0,02	0,2	22,0
III quarter of 2003							
1	Drinking water wells	6,8	360,0	not found	0,01	2,2	398,0
2	The river at the entrance of the SPZ	6,9	227,0	not found	0,03	0,2	230,0
3	River at the outlet of the SPZ	6,9	265,4	not found	0,01	0,2	270,0
4	Water intake № 1	6,6	88,1	not found	0,01	0,3	н/о
5	Water intake № 2	6,5	82,3	not found	0,005	0,3	21,5
IV quarter of 2003							
1	Drinking water wells	7,5	384,3	not found	0,008	2,1	430,0
2	The river at the entrance of the SPZ	8,3	237,9	not found	0,023	0,2	230,0
3	River at the outlet of the SPZ	8,0	274,6	not found	0,009	0,2	270,0
4	Water intake № 1	7,3	97,6	not found	0,010	0,4	н/о
5	Water intake № 2	7,0	97,6	not found	0,004	0,3	20,0
MPC (fishery water), mg/lit		—	—	—	0,08	40,0	100,0
MPC (drinking water), mg/lit		—	—	—	3,3	45,0	500

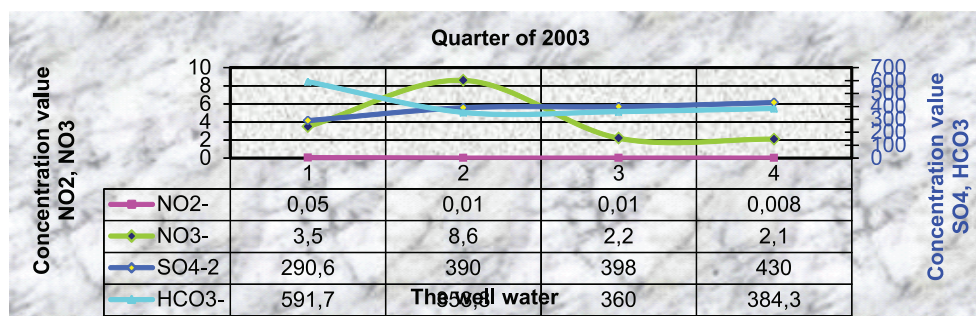


Fig. 1. The concentration of chemicals in drinking water wells

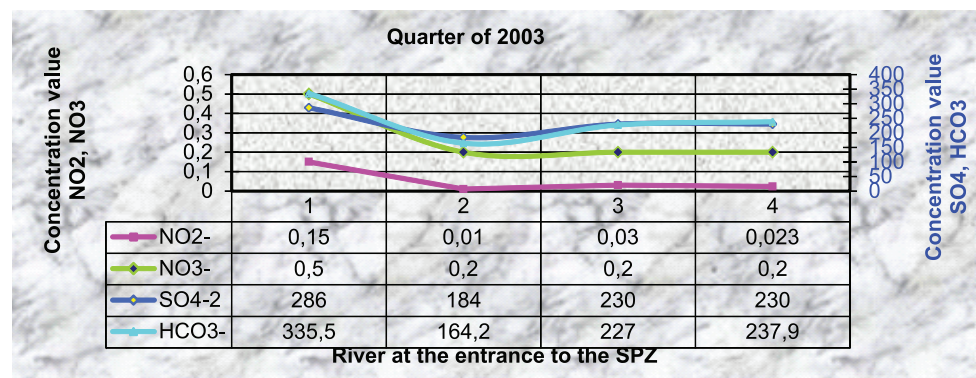


Fig. 2. The concentration of chemicals in the river at the entrance of the SPZ

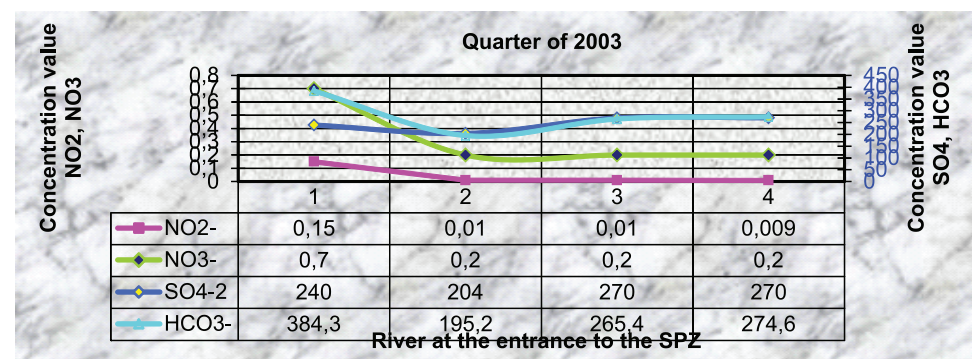


Fig. 3. The concentration of chemicals in the river at the output of the SPZ

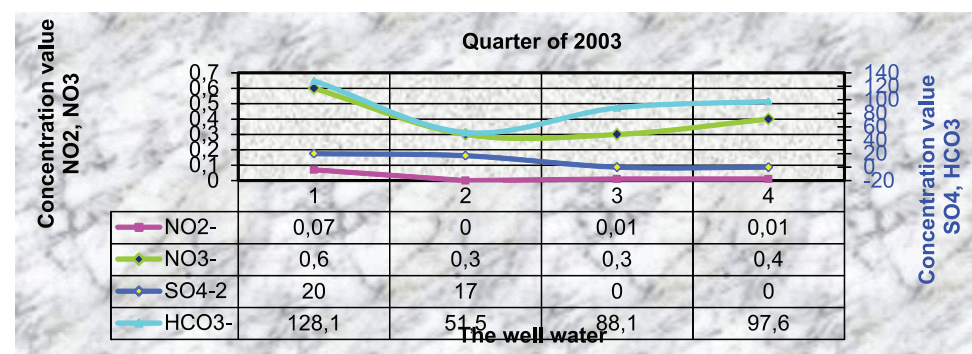


Fig. 4. The concentration of chemicals in water wells

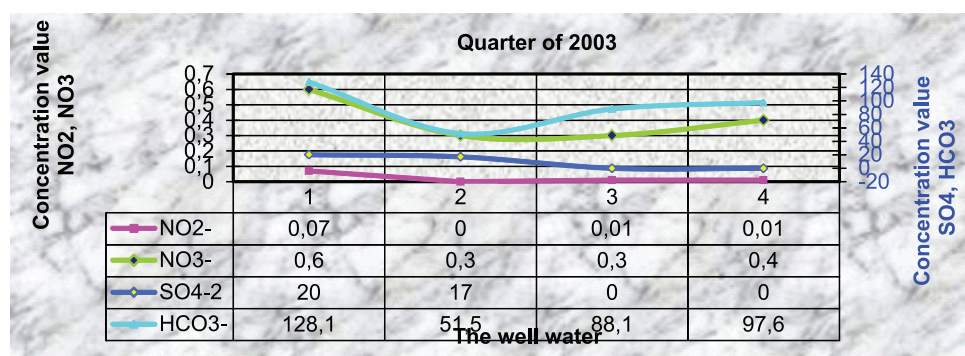


Fig. 5. The concentration of chemicals from the water intake № 2

Within 120 days on the surface of the water keeps the ice. At this time, the accumulation of dirt on the surface of the ice and under it due to seepage of oil from flooded wells. Therefore, in the spring

creates an increased concentration of hydrocarbons in water, due to reach the surface of water accumulated over the winter, and with the influx of meltwater from the coastal area adjacent to the mine.

Table 6

Results of chemical analyzes of water. Heavy metals and petroleum products

Point Number	The location of the sampling	Concentration of chemical substances, mg/lit						
		Cr	Ni	Zn	Cu	Pb	Cd	Petroleum products
1	2	3	4	5	6	7	8	9
<b>I quarter of 2003</b>								
1	Drinking water wells	0,02	0,005	0,05	< 0,003	0,003	0,001	not found
2	The river at the entrance of the SPZ	0,02	0,002	0,07	0,02	not found	not found	not found
3	River at the outlet of the SPZ	0,06	< 0,001	0,05	0,02	not found	not found	not found
4	Water intake № 1	0,02	0,013	0,06	< 0,003	н/о	н/о	not found
5	Water intake № 2	0,03	0,002	0,07	0,02	0,005	0,002	not found
<b>II quarter of 2003</b>								
1	Drinking water wells	0,02	not found	0,02	not found	0,003	0,001	not found
2	Temir river (at the entrance of the SPZ)	0,02	not found	0,02	0,005	not found	not found	not found
3	Temir river (at the outlet of the SPZ)	0,02	not found	0,02	0,005	not found	not found	not found
4	Water intake № 1	0,02	not found	0,02	0,003	not found	not found	not found
5	Water intake № 2	0,03	not found	0,03	0,003	0,005	0,002	not found
<b>III quarter of 2003</b>								
1	Drinking water wells	0,02	not found	0,02	3,0	0,002	0,001	< 0,005
2	Temir river (at the entrance of the SPZ)	0,02	not found	0,03	0,08	not found	not found	< 0,005
3	Temir river (at the outlet of the SPZ)	0,03	not found	0,04	0,17	not found	not found	< 0,005
4	Water intake № 1	0,02	not found	0,02	not found	not found	not found	< 0,005
5	Water intake № 2	0,02	not found	0,02	0,02	0,003	0,001	< 0,005
<b>IV quarter of 2003</b>								
1	Drinking water wells (Sorkol village)	not found	not found	0,02	3,45	0,002	0,001	< 0,006

End of Table 6

1	2	3	4	5	6	7	8	9
2	Temir river (at the entrance of the SPZ)	0,02	not found	0,02	0,09	not found	not found	< 0,006
3	Temir river (at the outlet of the SPZ)	not found	not found	0,03	0,19	not found	not found	< 0,006
4	Water intake № 1	0,01	not found	0,01	0,05	not found	not found	< 0,006
5	Water intake № 2	0,01	not found	0,03	not found	0,004	0,001	< 0,006
<b>MPC (fishery water), mg/lit</b>		<b>0,001</b>	<b>0,01</b>	<b>0,01</b>	<b>0,001</b>	–	<b>0,001</b>	<b>0,05</b>
<b>MPC (drinking water), mg/lit</b>		<b>0,05</b>	<b>0,1</b>	<b>1,0</b>	<b>1,0</b>	<b>0,03</b>	–	<b>0,3</b>

The results of data analysis studies of soil, surface water and groundwater have shown that the presence of heavy metals, macro components, petroleum products requires a special attention, supervision and control over these environments.

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*Materials of Conferences***FRAME ANALYSIS  
OF THE MEDIATION TERMINOLOGY**

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Mediation as a form of alternative dispute resolution was introduced in response to the necessity of unloading courts from a huge amount of civil (non-criminal) cases. In comparison to a judge, a mediator does not issue a decision but helps the parties reduce differences and find their own solution in a way that meets their unique interests. Mediation is gaining more and more popularity as it promotes confidentiality, "detailed" negotiations. Moreover, it is a time-saving and completely voluntary procedure that allows parties to compose a mediation agreement themselves.

As content harmonization is one of the priorities of the terminology science, the most significant issue to address is the standardization of terminological principles and methods. Thus, the purpose of the present paper is to prepare a full-scale description of the mediation terminology (MT) by modeling its cognitive frame and considering it in terms of content and structure. The focus of the research on the analysis of cognitive features of the MT is, in the first place, due to the lack of an in-depth study of any linguistic aspects of this relatively new and rapidly growing terminology.

*Modeling of the MT-frame* was based on the proposition that mediation is a well-developed field of knowledge, which implies the secure foundation – a theory that uses a set of special terms to formulate the principles of the procedure, to maintain sessions as well as mediation documentation. Cognitive framing of the MT is founded on the semantic ties between the main groups of mediation terms. The result of this work is the construction of a cognitive level [1] that incorporates special words (used in different types of mediation, mediation documents, agreements etc.) grouped according to cognitive relations between them, which reflect both the outer (semantic) and the inner ties between the concepts (motivation, possibility of an opposition). The MT can be described as a collection of terms that are grouped on the basis of certain structural and conceptual-semantic relationships that form a functional structure, which correlates closely with the mediation referential sphere. The set of terms of the field of mediation does not arise spontaneously but is systematically constructed by specialists, therefore, the MT is characterized by such properties as consistency, dynamic character; relative stability.

The parameter that specifies the frame is the dynamical growth of this young terminology which

determines the arrival of new terms into the system. Besides, penetration of the named procedure into various aspects of social and legal life, as well as expansion of the functions of a mediator is reflected in numerous updated definitions, which trace out additional information about the procedure.

In the context of the MT-frame modeling, basic concepts were tracked down, procedure terms were divided into topic-groups and the main tendencies within the named terminology were described.

- One of the specific tendencies applicable to the MT is the "terminological boom" which is basically a phenomenon that implies the process of multiple term sets entering a certain terminology in a relatively short period of time under the influence of the development of the information society. Thus, mediation is becoming more popular in the XXI-th century, new kinds of procedures appear (including online-mediation and peer mediation at school), which is certainly a factor in the formation of new terms. Mediation as a formal procedure appeared in the 1990s, and back then mediators were mainly engaged in commercial disputes. In the 2000 the MT acquires new terms which reflect concepts used in the process aimed at the settlement of family disputes, medical conflicts etc. The terms "*peer mediation*", "*area-wide bargaining*", "*binding arbitration*", "*elder care mediation*" appeared only after 2005, when the public and government initiatives got focused on the popularization of non-judicial means of dispute resolution and implementation of mediation procedures.

- The next characteristic of the MT that was taken into account for the MT-framing is relative stability of the MT. Mediation is just beginning to be implemented in the life of society, and therefore, its terminology continues to grow steadily. However, it is worth noting that the tendency to preserve traditional terms (that is typical of the legal language) can be seen quite clearly in the MT. Despite the fact that the mediation decision is made on the basis of mutual agreement, it is expected that the terms, fixing agreement between the parties should be as accessible as possible, "traditional", and should not confuse participants of mediation session. It can be concluded that the terms which are the "building blocks" for the deployment of the main stages of the mediation discourse are primarily actively used words and phrases, known to the majority of people (e.g. *interest*, *neutral*, *persuasion*, *threat* have clear, almost transparent, motivation).

- The MT services rather a specific sphere of professional activity, since, despite the fact that mediation is a more informal prototype of the trial, the inherent characteristic of mediation is the absence of strict proceedings, and as a result, more informal language means which are used within the discursive

model. This accounts for the presence of some cultural terms used to designate of the principles and strategies of conflict resolution.

- Today, mediation is becoming more popular in the world, but first time the procedure was introduced in the USA and it is in America where the first school for mediators and professional associations were founded. Until 2005, the main countries which officially practiced and promoted mediation were America, Australia, Canada and Britain. The initial geographical and linguistic isolation of mediation and, therefore, of the MT caused formation of some "cultural" procedure-related terms which were linked to American (Australian, Canadian and British) historical and cultural realities (*logrolling*: originally – national pastime; in mediation – the practice of mutual support) or specific cultural image (*Kangaroo court* – a term coined by the Australian Association of mediators, a parody of the trial; the court, flouting the principles of justice).

- The MT is an open set of technical words or expressions which denote the core concepts of the mediation practice and are used in mediative texts, documents, during the process of discussion of the case with the parties involved, in the legal dispute and decision making and different mediation styles use different terms for denoting official request for providing mediation services (*claim, application, appeal*). Mediation texts are also characterized by specific terminology used for designating the participants of the mediation process.

- The MT has multiple intersections with terminologies of the adjoining fields of knowledge. Those intersections first concern terminologies which serve to the related discursive models of alternative dispute resolution (ADR): negotiation (negotiate with the participation of a mediator), arbitration (arbitration) and conciliation (conciliation, reconciliation).

- The mediation discourse, though being a part of the legal discourse (LD), differs from other legal discourse practices in respect of terminological density. The language of the LD is extremely precise, technical and defies misinterpretation, so terminology is an essential part of legal texts and it is hardly possible to paraphrase or omit terms in LD. By contrast, the process of alternative dispute resolution is less formal than a standard process in the courtroom because of the variety of informal verbal means implemented in mediation procedures – from conflict discussion at a mediator's office to on-line negotiations which do not include strict official regulations for statements and speech formulae. Therefore quantitatively terms are more frequently found in traditional legal texts.

- It must be noted that the MT does not only borrow terminological units from the related terminologies, but also acts as a "donor" [2]. Considering that mediation is a part of ADR (Alternative Dispute Resolution) which at the same time belongs to legal discourse, we can presuppose a possibility of mutual term exchange, and borrowings within these terminologies (the processes that we will further refer to as "content interaction"). In addition, informal

style of mediation sessions and pragmatic orientations of the parties stipulate penetration of specific psychological terms into MT. Forming multiple intersections with related terminologies, MT does not only borrow terminological units, but also behaves as content "donor". ADR terminology is a complex system that unites terminologies which ensure the functioning of the four most common out-of-court practices – mediation, arbitration, negotiation, and conciliation. Although these procedures are similar, they do not only use different methods (e.g. arbitrator makes the final decision himself but mediator just facilitates negotiations) but also specific terms (NADRAC, 2002). Since ADR in general and mediation in particular are considered in the legal context, general legal terms are widely used in processes of alternative conflict resolution. Moreover, linguistic requirements for MT, providing its informative quality, resemble the characteristics of legal terminology with some reservations concerning the "stability" of MT. It can be called just relatively stable, primarily because the procedure is relatively new and, consequently, its terminology is evolving, being replenished with new elements. Besides, the idea of abandoning traditional terms used in the legal field, can be traced quite clearly in MT. Despite the fact that any mediation decision is made on the basis of mutual consent but not a regulatory act, it is assumed that the terms fixing agreements between the parties, should be as "accessible" as possible. It can be concluded that the terms that serve as "building blocks" for the deployment of the mediation discourse are primarily words and phrases known to most people who decide to enter mediation.

Thus, having analyzed the immanent features of the MT, it is possible to draw a conclusion that the MT-frame is a inhomogeneous formation that has numerous intersections with other areas of professional activity which are related to the conflict resolution. The main characteristics the MT is its dynamic character, a tendency to accept new terms as well as to borrow the terms of the related industries and the relative stability.

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# TRANSLATION STUDIES: FROM PAST TO FUTURE

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Translation was originally studied as a linguistic phenomenon, as a process of sense transfer via linguistic encoding, and therefore, translation studies were opened as a linguistic integrated discipline. Efforts were made to cultivate a “science of translation”, or a linguistic theory of translation, whose purpose was to provide an accurate description of the equivalence relations between signs and combinations of signs in the source language and the language of translation. After many periods prevailed by a recurring and, according to the philosopher Steiner, ‘sterile’ debate over ‘literal’, ‘free’ and ‘faithful’ translation, in the 1950s and 1960s more comprehensive approaches to the study of translation appeared and they were linguistically focused. During the following years, as the professors of English and Translation Studies Ulrych and Bolleteiri Bosinelli showed, the ties between translation and linguistics got even stronger, thanks to the evolution within linguistics of new paradigms which investigated “[...] language as a social phenomenon that takes place within specific cultural context”, like discourse analysis, text linguistics sociolinguistics and pragmatics [1].

By the early 1960s radical changes had taken place in the area of translation studies (TS), with the increasing acceptance of the study of linguistics and stylistics within literary criticism that had led to developments in critical methodology and also with the reconsideration of the work of the Russian Formalist Circle. The most important developments in translation studies in the 20th century deduced from the groundwork done by groups in Russia in the 1920s and later by the Prague Linguistic Circle and its disciples. Since 1965, global progress has been made in translation studies. The work of scholars in the Netherlands, Czechoslovakia, the Soviet Union, Germany and the United States seem to point at the formation of clearly marked schools of translation studies, which place their accent on different aspects of the entire vast area. In addition, translation specialists have retrieved a great deal from work in marginally related areas. Arising in the 1970s, progress in the 1980s and prosperity in the 1990s TS has evolved incredibly in the past 20 years and is now in the process of the synthesized process of unification. TS has progressively emerged into a discipline in its own right, or rather, as said, into a ‘multidisciplinary, which draws on a wide spectrum of other discipline and consequently could be efficiently described as “a house of many rooms”’.

One of the first moves towards interdisciplinarity was explored by Snell-Hornsby’s “integrated approach”. The method was meant to bridge the

gap between linguistic and literary-oriented methods, proposing a model which would embrace the entire range of language and draw ideas from other disciplines, such as psychology, ethnology, philosophy, as well as cultural history, literary studies, sociocultural studies and, for specialized translation, the study of the specific domain involved (medical, legal, etc.). In Europe translation was seen for many decades either as simple linguistic transcoding (studied as a sub-discipline of applied linguistics, and only navigating on specialized translation), or as a literary practice (considered as a branch of comparative literature and only concerned with the translation of canonical works of art). The translation theorist Andre Lefevere suggested that the name “translation studies” should be accepted for the discipline that concerns itself with the issues raised by the production and description of translation. The Routledge Encyclopedia of translation studies determines ‘Translation Studies’ as “[...] the academic discipline which concerns itself with the study of translation”. As Baker says, although originally aiming at literary translation, TS “[...] is now understood to refer to the academic discipline concerned with the study of translation at large, in particular literary and nonliterary translation”. The Iraqi-British translator Hatim says about TS as the discipline “[...] which concerns itself with the theory and practice of translation”. While attempting to determine the purpose of translation studies, Lefever offered that its goal was to produce an inclusive theory which can also be used as a useful tool for the production of translations, and whilst some may question the peculiarity of this position, his clear aspiration to link theory with practice is considered undisputed. The necessity for systematic study of translation arises directly from the issues faced during the actual translation process and it is as important for those working in the area to get their practical experience to theoretical polemic, as it is for growing theoretical penetrating to be put to use in the translation of texts. To set the theory from the practice, to set the scholar against the practitioner as has happened in other disciplines would be sad indeed.

The practical aspect of translation without a theoretical base tends towards a cleanly subjective exercise. As Professor Colin Yallop reminds us, one of Halliday’s basic contributions to linguistics is his eagerness to build bridges between linguistic theory and professional practice. “When dealing with translation, we firmly believe that this need is even stronger. Knowledge in two languages, the source one and the aim one, is needless to say not sufficient to become a wise and experienced translator”.

Translation theory is topical to translators’ issues, and not only for academic goals, but also to the practice of a professional translator, since it can “[...] offer a set of conceptual tools [that] can be thought of as aids for mental problemsolving” [2]. Theory and practice are inseparably connected, and

are not in conflict. Understanding of the processes can only help in the production and, a philosophy of translation without a link to practice is simply an abstraction.

Furthermore, as the translation theorist Bassnett mentions, although translation studies cover such a wide field, it can be tentatively divided into four total areas of interest, each with degree of rediscovery. Two are product-oriented, in that the accent is on the functional aspect of the TL (target language) texts in relation to the SL (source language) text, and two of them are process-oriented, in that the accent is on analyzing what actually takes place during translation. The first direction includes the History of Translation and is an individual part of literary history. The type of work involved in this field includes investigation of the concepts of translation at different times, the critical response to translations, the practical processes of publishing translations, the role and function of translation in a given period, the methodological elaboration of translation and, by far the most common type of study, analysis of the work of individual translators. The second direction, translation in the TL culture, expends the work on single texts or authors and involves work on the influence of a text, author or genre, on the absorption of the norms of the translated text into the TL system and on the principles of selection operating within that system. The third direction, translation and linguistics, involves studies which place their accent on the comparative agreement of linguistic elements between the SL and the TL text with consideration to phonemic, morphemic, lexical, syntagmatic and syntactic levels. Into this category come studies of the issues of linguistic equivalence of language-bound meaning of linguistic untranslatability of reproduction translation, etc. and also studies of the translation problems of non-literary texts [3]. The fourth category, freely called translation and poetics, involves the whole field of literary translation, in theory and practice. Studies may be general or genre-specific including research of the particular problems of translating poetry, theatre texts and the related problem of translation for the cinema, whether dubbing or sub-titling. Under this category also arrive studies of the poetics of individual translators and comparisons between them, studies of the problems of articulation a poetics, and studies of the interrelationship between SL and TL texts and author-translator-reader.

Ulrych and Bosinelli expounded the burgeoning discipline of TS as follows: the term 'multidiscipline' is the most capable in describing the present state of translation studies since it emphasizes both its independent nature and its plurality of perspectives.

Translation studies can in fact be browsed as 'metadiscipline' that is able to locate various dis-

ciplines with their concrete theoretical and methodological frameworks and thus to conceptualize field focusing, for instance, on linguistic aspects of translation, cultural studies aspects, literary aspects and so on. Their consideration of TS is akin to the Iraqi-British translators Hatim's view that "[t]ranslating is a multi-faceted activity, and there is room for a diversity of perspectives' According to opinion Snell-Hornby [...] Translation studies reveals new perspectives from which other disciplines – or more especially the world around – might well benefit. It is concerned, not with languages, objects, or cultures as such, but with communication across different cultures, which does not only consist of the sum of all factors includes. And what is not yet appropriately realized is how translation (studies) could help us communicate better – a deficit that sometimes has catastrophic results.

Besides, nowadays translation research has started to take a different way, which is more automatic. The invention of the internet, together with the new technological developments in communication and digital materials, has increased cultural exchanges between nations and individuals. This leads translators to look for ways to cope with these changes and to look for more practical techniques that enable them to translate more and waste less [5]. Screen translation translates all kinds of TV programs, movies, series, etc. This field bases of translation software programs; composed of two methods, dubbing and subtitling, audiovisual translation starts a changing era in the domain of translation.

In conclusion it can be said that translation has a very rich history, it has been the subject of lots of research and conflicts between theorists, each of which approached it according to his own viewpoint and field of research.

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