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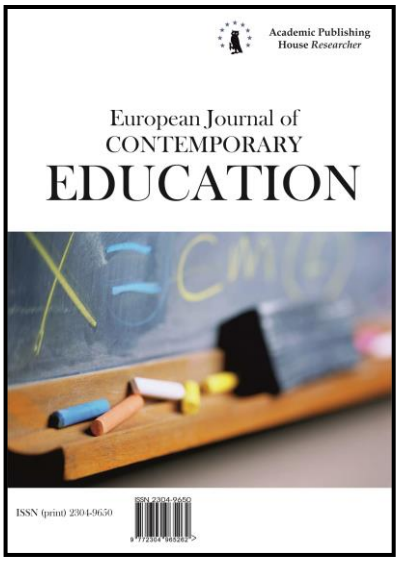

The Problems of Contemporary Education

The Innovation Blaze-Method of Development Professional Thinking Designers in the Modern Higher Education

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Abstract

This article proved the urgency of the problem of development of professional thinking of students studying design in modern conditions of higher education. The authors substantiate for the need of an innovative Blaise-method development of professional design thinking of students in higher education. "Blaise-method" named by us in accordance with the English translation of "blaze", which means flash, bright light. It aims to organize the efficient and harmonious functioning of the brain in the process of project activities and is based at the creative mental condition of the individual, which is achieved when performing exercises developed with the use of alpha-technology "BLIC". Thus, the authors emphasize the innovation of the blaze – the method of development of professional design thinking.

Keywords: innovative, blaze-the method, design, design thinking, development, professional, education, University, alpha state.

1. Introduction

The article reveals the urgency of the problem of development of professional thinking of the personality in the field of design-training in the modern University. The modern world is constantly in a permanent state by certain changes, transformations and converting. Now developing Nano technology happens evolving of innovations in the theory and practice of education. All sphere of social and public life are undergoing tremendous changes in connection with the development of IT technology and the Internet. Accordingly and the education system is

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subjected to optimization and transformation. In the current circumstances, universities need to adapt to fast-changing trends of today. Universities become a source of innovation. Modern higher education is developing rapidly. The world is changing. Go transformation in the system of Russian and foreign education. In 2015, the modern problems of education in the world are treated at the meeting of UNESCO in the Republic of Korea. In the adopted Incheon Declaration of UNESCO "Education-2030" sets out new ideas on ways to improve the quality of life of people in the world community through the development and reform of the education system (UNESCO, 2015).

Many universities recognize the need to keep up with the times. They are revising their teaching and research activities in accordance with the new requirements of society and the state, thus emphasizing the discrepancy existing, so-called traditional teaching methods. It should be noted that progressive teaching staff of universities ready to change their attitude to the introduction in educational process of pedagogical innovations. They treat innovation as something new which is based on scientific knowledge. Of innovative this activity of professors and teachers of higher education institutions is the development and the realization of this the research and application of innovations aimed at improving the effectiveness of quality training. It is a means of development and renewal of educational policy states.

There is a growing need in modern and innovative pedagogical methods of teaching and development of professional activity of students. A priority of educational systems in Russia and abroad is to train highly qualified specialist.

Accordingly, it is necessary the search and introduction of innovations directed to the effectiveness of learning processes and personality development in her professional activities, i.e., educational innovations. This underlines the importance of revising teaching methods and professional development of graduate students and identifies the relevance of this study.

In 2017, the Organization for economic cooperation and development (OECD) has developed guidelines for an innovative learning environment. The Handbook contains the results and materials of the innovative learning environment, collected by the OECD over the last decade. There reveals the principles of innovative learning and the analysis of thinking processes. Note that the OECD to recommending in the field of education set a direct connectivity of professional education and professional thought, competences, skills and abilities of graduates to enhance their mobility in the labour market, further training and career growth (OECD's, 2017).

It is obvious that in the current situation, cooperation in education, culture and economy, the question becomes more urgent the international exchange of students. It is obvious that in the current situation of interaction between States in education, culture and economy, the question becomes more urgent the international exchange of students. In the context of this study note that international exchange in the field of design is growing rapidly.

When researching this problem the authors identified a critical contradiction in the system of education, science and art not only in Russia but also in many foreign countries. On the one hand there is the social order, against the educational institutions. This ordering consists of the need to the formation and development of initiatives and enterprising personality, her self-identity. They need to master General cultural, general professional and professional competences. These people can have the following competencies: General cultural, general professional and professional. She is advised to be responsible for universal and universally valid values. It is recommended taking responsibility for the universal and universally valid values. Herewith, she should be open to constant self-education, to be ready to innovations and changes, to be able to identify freely in the cultural space of values. She should be able to use their professional, intellectual and creative abilities in life and work. And on the other hand deficient and somewhat outdated psychological and pedagogical and methodical base of development of professional thinking of the students. The elimination of the causes and the emergence of a new contradiction, according to scientists, allow the individual to rise to a higher stage of development. Only becoming a subject of design and creative activities in education, science and design person has an active life and professional position. The purpose of this article is the evidence base and rationale necessary for the use of innovative blaze-method of development professional design thinking in the context of modern higher education. In English the blaze – flash, bright light. The novelty Blaise-the method propose by the authors lies in its focus on the harmonious working of the brain in the process design activities of the designer, which is based on creative mental state of a person in the mode of the alpha rhythm of the brain and is achieved in the application technology Glare. Glare is

the flash, i.e. English blaze. Thus, the foundation of the Blaise-method is the psychological emotional alphas-state of the individual which contributes to the development of design thinking, which emphasizes the novelty of this method. Note that currently the pedagogical science does not take into account when developing main guidelines and training methods features the harmonious functioning of the brain in the process of creative activity on the basis of psychological alpha status of the individual. Hypothesis of the study was the assumption that if in the process of learning designers implement innovative blaze-the method of development of design thinking students, then this will positively affect the dynamics of the level of their professional abilities.

2. Materials and Methods

Methodology this study is a set of methods, principles and techniques of scientific analysis and experimental studies, systematic study of psycho-pedagogical phenomena of scientific excellence, activity-based and communicative approaches (S.I. Arkhangelsky, Yu.K. Babanskiy, V.V. Krayevsky, V.A. Slastenin, A.I. Shcherbakov).

This experimental study was conducted by the authors using the method of statistical observation, as well as methods of matching the two samples on the frequency of occurrence of the desired effect in the application of blaze-method in the development process of design thinking in the classroom design through the angular conversion Fischer. Applying the Fisher criterion, the authors evaluated the significance between the percentages of two samples of the experimental and control groups. In the process of statistical analysis of the results of the study, the authors translated the percentage of the value of the Central angle in accordance with the corner of the Fisher transformation, which is measured in radians. Note that the greater the angle φ corresponds to a higher percentage portion, despite the fact that correlations are not linear: $\varphi = 2*\arcsin(\sqrt{P})$, where P is the percentage part expressed in shares of unit. The greater the value φ*, the most significant differences. Working with criterion Fisher should pay attention on his hypothesis, where the proportion of students in the group in which appears the effect of the development of professional design thinking in the process of the project activities according to the established criteria, when the application of blaze-method in sample 1 does not exceed the sample 2 and is denoted as H_0. At the same time H_1 is indicated by the percentage of students who have manifested the investigated effect and sample 1 is greater than the sample 2 (Sidorenko, 2007).

The basis of this study consists of the doctrine of the unity of the abilities and thinking of a man with his active activity B.G. Ananiev, JI.C. Vygotsky, B.M. Kedrov, A.N. Leontiev, C.JI. Rubinstein etc. The problem theory and practice of professional training of designers solved foreign and domestic experts, such as Bruce Archer (England, 1968), that introduced a systematic design methods in design. He proved paramount the importance of needs, next is arise the problem and they satisfaction (Boyd Davis, Gristwood, 2016).

John.Chr. Jones (England, 1986) uncovered psychological peculiarities of the project analysis methods of artistic design and engineering design (Jones, 1986). Martin Bella, Bruce Huntington (USA, 2014) developed universal methods of design (Bell, Huntington, 2014). Donald A. Norman (USA, 2006) reveals the principles of design in his "Design of everyday things" (Norman, 2006). Lidwell William, Holden Kritinia, Butler Jill (USA, 2012) was formulated universal design principles (Lidwell et al., 2012). We note science sources which to aimed at comprehensive training and development of many abilities in vocational education, including design B.A. Efimova, B.S. Mails, V.P. Bespalko, G.K. Selevko, N.B. Arganovo etc. The theoretical base of the research Director of the design Studio IDEO Tim brown is a study of the techniques of design thinking when doing a design project, as well as in business and everyday life (USA, 2013) (Brown, 2013).

The authors conducted an analytical study of many contemporary scientific publications on innovation and innovation practices in education in different countries of the world. So in the doctrine Furst-Bowe and Julie A. Bauer Roy A. (USA 2007) «Application of the Baldrige Model for Innovation in Higher Education» presented innovative approaches in the University of as an important most significant change that is having a positive impact on improving the quality of education (Furst-Bowe, Bauer, 2007). The main criterion of innovation in the field of education Guillermo Orozco-Gomez proposed to consider specific visible good results (Mexico, 2006). (Guillermo Orozco-Gomez, 2006). Zhang Siaoway (China, 2007) investigated Chinese reform pedagogy art project. The Ju Chjaochung (China, 2014) to have studied and identified the didactic

bases of teaching fine arts to students of Russian and Chinese universities. Wei Hao (China, 2009) have developed methods of formation of professional qualities of the artist-designer. He stressed that the existing system of education in the field of design in China and other countries is outdated (Wei Hao, 2009). Bruce-Davis, M. N., Gubbins, E. J., Gilson, C. M., Villanueva, M., Foreman, J. L., & Rubenstein, L. D. (2014) in journal of advanced scientists they reveal the peculiarities of perception of leaders, teachers and students the innovative learning and educational-methodical strategies and practices (Bruce-Davis et al., 2014). The development of innovative pedagogy aimed at the formation of the creative potential in Indonesia is exploring Juha Kettunen (Indonesia 2017) (Juha Kettunen 2017). The issue of innovation pedagogy in higher education and creating a learning environment causes anxiety for scientists of the countries of Japan, the Republic of Korea and Singapore (Building 2017) Methods of developing training in innovative pedagogy reveals and offers T. Const (2017) (Konst, 2017). S. J. Renzulli (USA, 2017), C.M. Callahan, & E. J. Gubbins (USA, 2014) examined the law Javits, which is considered to be one of the cornerstones in the education system as a necessary base for the future (Gubbins et al., 2014). In 2013, T. Penttilä & A. Putkonen made a presentation at a scientific conference in Valencia (Spain 2013) about the knowledge in the context of innovation in the field of pedagogy in higher education (Penttilä, Putkonen, 2013). The problem of formation and development of abilities of the individual attracts both foreign and Russian scientists S. I. Aboimov (2010), V. Andreev (2016), Wei Hao (2009), W. S. Barber, S. L. King (2017), Seechaliao Thapanee (2017), L. Glazurina (2015), G. N. Ibragimov (2013), E. Visser (2009), E. F. Comindico (2016), D. Sherwin (2013), L.E. Shmakova (2009), M. V. Shcherbakov (2014), Cheng Xiaohua (2007), Beghetto, R.A. (2016). Beghetto, R.A., & Sriraman, B. (2016), etc (Barber, King, 2017).

For this study became relevant the scientific achievements in the field of educational psychology, academician, Dr. of psychology Cziksentmihalyi Mihai (2013). In their publications and books Cziksentmihalyi Mihai reveals the results of the introduction and then proves the necessity of inclusion in social and private life personality a special psychological state that he calls flow. The condition, which includes motivation which is aimed at the result of professional design and creative activity of personality, is the explanation of the thread state. Scientist reveals the emotional state of a person who is in flow. This feeling of joy, freedom, full satisfaction. The state of the thread unites in a single unit motivation, attention and situation, that leads to harmony and productive feedback loop, that is, to will help to achieve high results in activities (Cziksentmihalyi, 2015).

V.S. Rotenberg examined in detail the state of operation of the human brain in the alpha mode of rhythm, which has the same quality characteristics as the state of the thread. In their studies V.S. Rotenberg empirically using electroencephalograph proves that when solving creative problems electrical oscillations work of the brain of man correspond to the frequency and the amplitude of the increasing alpha rhythm (ν = 8-13 Hz, A = 50-100 mV). It is a condition scientists call a state of relaxed wakefulness. Note, that design and creativity of the designer is a very complex and lengthy process, which is often accompanied by emotional rise and burst of energy, no tiredness or fatigue. This activity state of the brain important for this study, based on it to get developed an innovative methodology of development of professional thinking (Rotenberg, Arshavsky, 2015).

This study also relies on research results of the structure of mind, Howard Gardner (2007), who developed the theory of multiple intelligences. Here we are interested in the classification of types of thinking, particularly visual-spatial (picture smart) interpersonal (people smart) types. Ability visual-spatial thinking is manifested at a high level in working with the space and its objects, to graphically Express their ideas in pictures, drawings, projects. This type of thinking is available to artists, designers, architects and other creative individuals. People with interpersonal mindset can communicate as verbally and using sign language, artistic – Imaginative and music information (Stone, 2006).

P.V. Simonov (1993) reveals the neurobiological basis of creative abilities in the study of the creative work of the brain. The results of these studies important to the development of innovative blaze-method of development of professional thinking of students in the field of design.

In General, the analysis of scientific psychological and educational research shows that scientists, referring to the study of particular aspects of problems of development of thinking, do not reveal the substantive content of the process, do not represent the ways and means of

professional development of future designers with a psycho-pedagogical point of view. This underlines the scientific-theoretical relevance of this research for the development and testing of an innovative Blaise-method of development professional thinking designers in the modern conditions of higher education.

Thus, the analysis of current scientific research suggests that the problem of development and introduction in educational process of innovative blaze-training method aimed at the development of professional thinking of students in the field of design has not been solved. Remain open questions of theoretical and practical nature that are intended to solve this study. It is urgent and requires a thorough, more in-depth study that significantly distinguishes it from modern ideas about the problem, will complement and deepen the already known approaches to it, will give a special theoretical significance and practical value.

Philosophical encyclopedic dictionary defines the term thinking as the deliberate process of mental, cognitive information processing, which is implemented in the acts of management of mental representations, is subject to specific policies that affect the emergence of new cognitive images.

In the context of this study the level of development of design thinking in solving design and creative tasks determines the quality of the professional abilities of the designer. Cutting-edge designers and scientists define design thinking as a specific way for artistic and creative and design thinking, which reveals the ability to find and create something new and creative to the already known mass.

In this case, professional design thinking is considered as an individual psychological property of the individual, which distinguishes the designer from experts in other areas, targeted to mental, cognitive, creative processing of information in consequence of which arise new project-art cognitive images.

The problem of creative thinking in artistic and creative activities in the interaction of the components of intuitive and logical researched by Russian scientists, artists and Professors N.N. Rostovtsev, N.N. Volkov, V.S. Kuzin, E.V. Shorokhov, I.V. Alekseeva and others.

It should be noted the need to include in the educational process and the method of achieving alpha status, as an innovative blaze method aimed at the development of design thinking of the individual, for to achieve the goals and progressive growth her of high professional level.

Innovation, blaze-the method of development of professional thinking of future designers is aimed at the harmonious working of the brain in the process of project activities according to the structure of design thinking, which includes figuratively-creative (imagery smart), volumetric and spatial (spatial smart) and project-creative (design smart) component.

3. The results of the study

In this article, the authors presented the results of a study of the development of professional thinking of students by means of innovative, blaze-the method of instruction in modern environment education Russian universities. Innovative blaze-the method based on the basis effective interaction of science and education.

The authors have developed a psycho-pedagogical method, using modern scientific achievements and knowledge in the field of cognitive neuroscience, neuropsychology, psychology of creativity, design and education.

The research is to built on creative mental condition of the person, on linkage harmonious to activity of the brain in learning and project activities of students in the sphere of design.

The authors conducted a pilot study to test the effectiveness of innovative blaze method of development of professional thinking of students on the lessons design and design. The choice of research methods depended on its content and processes studying the problems of development of design-thinking students. The authors used scientific methods of observation, conversation, testing, questioning, organizing, and conducting views of design projects, to identify the level of creative thinking in the control and final stages, the analysis and conclusions. Experimental research and testing was conducted at the departments of design art-industrial Academy, Krasnodar State University of culture and arts (2011–2014) and Gzhel State University (2015–2017).

Experimental work with students was organized in the following areas:

- revealed the source benchmarks the level of development of professional thinking of the students to the project activities in the field of design;
- determined features of the influence of switching of the brain when going into alpha mode- the in carrying the project activities of University students, that is, revealed the influence of the alpha state on the opportunity to see the results of the development of his professional thinking in the process design activities of the designer;
- revealed feature technology fast entry into the alpha state;
- developed an innovative method of development of professional thinking of students in the classroom design planning, which outlined as blaze method;
- researched and experimentally tested the effectiveness of an innovative Blaise-a method who is directed at the development of professional thinking of students to design activities of the designer;
- researched, analyzed and studied the results of the experiment was be determined the levels of development of professional design thinking students.

The authors in the first phase of the pilot study it revealed that most of the students has the makings of artistic abilities accentuating the presence of design thinking at the initial stage in propaedeutics activities. Were identified three groups of levels of professional thinking of students learning in the area of training design.

The experiment involved 168 people, including in the control groups - 80 persons, in experimental groups – 88. In addition, was carried out both individual and collective research. At the results of the test were formed of a control group using standard teaching methods of design, in each with of studiedan enrollment of on 20 people. The experimental group consisting of 22 people, was createdto carry out design activities using innovative blaze-method of development of professional thinking of students in the field of design. The result of the level of design thinking of students as their professional activity is developed in the classroom design project environmental object or sample of the product for industrial production.

The quality of the developed project is determined by the increase in the level of professional thinking of the designer. To identify the level of professional thinking of the students to the artistic and project activities, we have developed the criteria for the evaluation of design projects (Table 1). The authors determined to which units (B-1, B-2, B-3) conditionally to pertain parameters of assessment are consist: figuratively-creative thinking, described as block 1 (B-1); volumetric and spatial thinking - block 2 (B-2); project-creative thinking block-3 (B-3).

The second stage of the pilot study as a consequence of the first, consists in testing theoretical and practical propositions of an innovative Blaise – a method that was developed by the authors and aimed at the development of professional thinking of future designers in modern conditions of higher education and definition degree its effectiveness.

Also defined the degree of dynamics of development of design-thinking and professional skills of bachelors of design at different stages of teaching students designing when included in educational process of innovative blaze-method.

Innovative, blaze-the method of development of professional thinking of the bachelors of design lies in the application of the developed exercises for student of the University in the process of activity design project. They are aimed at the harmonious working of the brain in the alpha mode status. This is a creative mental state personality, promoting the effective development of professional thinking of future designers.

It is characterized by psychological, bio-adequate relaxation-active state of harmony and balance of the individual, as well as of positive, lightness and flight, the emergence of a variety of options to perform a professional activity in design, the emergence of a sense of satisfaction with the outcome of the research in the field of design.

Table 1. Criteria for assessing levels of development of professional design thinking of students in learning design

Evaluation criteria	Low	Medium	High
Conceptuality – the original idea and compliance the artistic, scientific, constructive intent (B-1, B-2, B-3)	Low level imaginative-creative, volume-spatial and project- creative thinking. Not compelling disclosure of the idea (conceptualization), there is no match the artistic, scientific, constructive intent. Poor knowledge of functionality and ergonomics. The lack of emotional organization of perceptual design project through tectonics, symmetry or asymmetry, metric or rhythmic ordering of the components of the design project, invoice, texture, contrast, color, form and decorative. The work is not completed, but to traced the relevance and innovativeness of design of the project detected the degree of importance at the moment and in this situation, for to solve problems of design, and to application of computer and information technology. This level is of imitative nature.	Unstable level of imagery and aesthetic expression. Convincingly proven the relevance and innovativeness – the degree of importance at the moment and in this situation, to solve problems of design, application of computer and information technology. With some of the shortcomings solved of the spatial structure of the project. The average level of decision shaping in accordance with its practical purpose and artistic-figurative characteristics. The constructive of the project and its compliance with artistic content. Not fully thought out ergonomics and functionality of the project. There is some exclusivity and novelty of the design project.	High level of conceptualization and matching the artistic, scientific, constructive intent. High degree solutions of imaginative and aesthetic expression - emotional organization of perceptual design project. The project is relevant, exclusive and has a high degree of innovation, functionality and ergonomics, sustainability, solutions, spatial structure, forming in accordance with its practical purpose and figurative characteristics. The design of the decision the project and its compliance with artistic content.
Figurative and aesthetic expressiveness – emotional perceptual organization via tectonics, the symmetry or asymmetry, metric or rhythmic ordering of the components of the design project, texture, texture, contrast, color, form and decoration. (B-1, B-2, B-3)			
Relevance and innovativeness – the degree of importance at the moment and in this situation, to solve problems of design, use of computer and information technology (B-1)			
Exclusivity and novelty (B-2, B-3)			
Functionality and ergonomics (B-2, B-3)			
Compliance with environmental friendliness (B-3)			
The decision space-spatial structure (B-2)			
The shaping in accordance with its practical purpose and artistic-shaped characteristics (B-1)			
The design solution of the project and its compliance with artistic content (B-3)			

The value and quality of this blaze-method are:

1. in absolute security for man, observed the harmony of biorhythms of the brain, underscoring its bio-adequacy.
2. the tension disappears, anxiety and stress.
3. appears emotional and physical strength when designing the object of design;
4. in the state of comfort (relaxation) and operational thinking (activity). In the most wide application and the opening of creative possibilities of the person in the course of the alpha rhythm of the brain;
5. in the opportunities dynamic development of creativity. The alpha rhythm of the brain contributes to the emergence of instant mental images after setting goals and objectives. Alpha state develops figuratively-creative thinking, volumetric and spatial and project-creative;

6. 6. in the rapid achievement of goals with minimal time and energy costs. In the alpha state is involved all the resources of the brain, which lead to enlightenment. Combined into a single unit motivation, goal-task (concentration) and activity (options and ways of solving problems). Revealed the possibilities of your own subconscious mind when in the unity are actively working of the creative potential of the right brain and the iron logic of the left hemisphere. The alpha state promotes the interaction harmony of the individual and productive feedback, i.e., uniting logic and intuition, leads to a high result of design thinking and professional activities.

Designed exercises fast entry into alpha state as the basis of innovative blaze-method of development of professional thinking the in learning designers the design appear in compliance with the harmony of biorhythms work the human brain. Member of New York Academy of Sciences Robert Stone, offers to learn four exercises of entering into the alpha state. Pay attention to the fact, to achieve a quick entry into the creative state of the personality is necessary about a month of daily workouts (Stone, 2006).

Psychologist practicing sleeper-hypnology Irina Belozerskaya, offers to apply exercise, which she calls "the Golden rule one minute." For entry into the alpha state quite one minute that the below brain began to work harmoniously in a creative and logical mode (Belozerskaya, 2016). Synthesis effective exercises for optimally fast entry into the alpha state of the above mentioned researchers, the authors took them as a basis for innovative, blaze-the method of development of professional thinking of students in project activities. First of all, before setting goals, it is recommended to relax and listen to yourself, to your rhythm of the heart. Then switch attention to what is happening in the surrounding world. It could be wind noise, dogs barking, birds singing, car horns, etc. Need to listen to the sounds and imagine what is happening in the environment. This is followed again to return his attention and to putting your mind on yourself and your inner world, on the rhythm of the heartbeat, breathing, zones of tension or relaxation in the body. And again switch back to the environment. Thus, the left analytical hemisphere, when you do not see the logic in what is happening, when there is a certain monotony, is losing interest in what is happening, it passes the control processes of the creative and intuitive right hemisphere of the brain. So there is occurs something condition which is most favorable for the perception of information, for the work imaginatively-creative, volumetric-spatial and design-creative thinking. However, obviously that there is a possibility for one minute log a creative state, the alpha stream. It is further recommended to visualize as whiskey, crown, nape, forehead, are open as the cupboard door, though the picture at everyone can has their own. The next thing it is important to perform is you must reveal yourself as if the fan is revealed or disclosed pine-cone, flower Bud, main thing is to enjoy the feel of disclosure. If this exercise is performed correctly, you turn around, you immediately take a deep breath even and begin to yawn. This breath is called "soul". It is a signal, that you have get entered in the condition alpha rhythm of the brain.

Another important point is the necessity of the awareness of being in the alpha state.

Here it is necessary to focus on the pineal gland (from the Greek. epíphysis – a growth, lump). You need to give yourself installation that you are in the pineal gland or epiphysis. For example, I am be in the epiphysis or I'm be in pineal gland. It was at this time there is a complete loss of consciousness, i.e., terminates work the left hemisphere of the brain and begins to do the job creative right hemisphere. Thus, there is another reality, as said the ancient philosopher Plato.

Since 1970-ies of dozens of research laboratories in the US, England, France, Yugoslavia, and others began to examine the function and morphology of the epiphysis as an activex neuroendocrine organ of the brain. But the epiphysis still remains poorly understood. The modern stage in the study of the epiphysis at rightly can be considered the first step in building original concepts. In Russia Professor pinelog (specialist epiphysis) A.M. Khelimskaya and a group of scientists headed by academician E.I. Chazov intensively studied the values and work of the pineal gland in the human body.

The next step in the application of blaze-method. After entering the alpha state, you must define a goal or define a specific task. In other words, give yourself a precise installation to carry out specific activities. For example, to develop the design of the lamp in five variants under to the bionic shape of the artichoke. And to this end to make a "Blik" (on I.I. Belozerskaya), that is powerful information-wave splash. In psychology, the glare is the flash that will be visualized in 3-D format emanating from the subject of visualization. Visualization can be presented in the form of bright solar flares, or fireworks. Everyone has their own individual ideas about "Blik". The main

thing is to imagine that our body is opened, for example, as scales of the cones and through them are released rays of bright light, in breadth, down, up, in different directions to infinity. Before performing flash is recommended to perform a short breath with under sigh a sharp exhale and to perform the technique "Blic". It should be remembered about the directional of your glance on the pineal gland, that is, be in the alpha state. Your goal becomes to most clearly in your consciousness, if we translate into the language of psycho-emotional state. If the exercises are performed correctly, the body will feel a light wave of resonant vibration, there comes euphoria, and with nothing incomparable bliss. Being in the relaxation-active state, quickly and effectively finder the way solutions to set tasks to achieve both creative and scientific purposes. The authors draw on research and evidence base of the effectiveness of biologically adequate, at the same time relaxation and active method of teaching students, and developed since 1999, proven I.V. Alekseev in the educational process of the University. The results were presented in the monograph and doctoral dissertation (2005) on the development of creative abilities of students to arts and crafts activities, which confirmed the efficiency of the presented method, development of creativity, based on the alpha rhythm work of the brain (Alexeeva, 2005).

An empirical study of the concluding stage of the experiment and the actual data of the comparative analysis, prepared by the authors, prove the effectiveness of the innovative blaze-method of development of professional thinking of students based on the harmonious functioning of the brain in the alpha state.

At the beginning of the experiment, the results of development of professional thinking of students in the field of design, the control group and experimental groups were mainly low level.

Only 4 people in the experimental group of 22 students and 5 of 20 in the control group had the makings to professional design thinking. Thus, using the method of angular conversion Fisher the authors came to the following conclusion that at the beginning of the experiment, the design thinking of students corresponds to the zone of insignificance, the results of the empirical values of φ*=0,537, which is located in the area indicated by shading on the axis of significance of figure 1 and H1 is rejected.

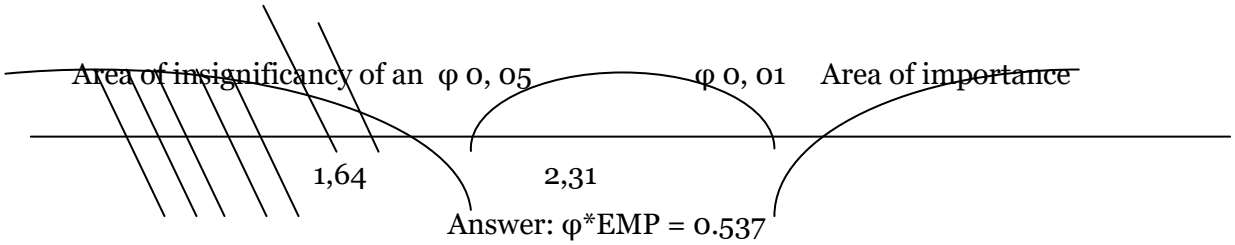
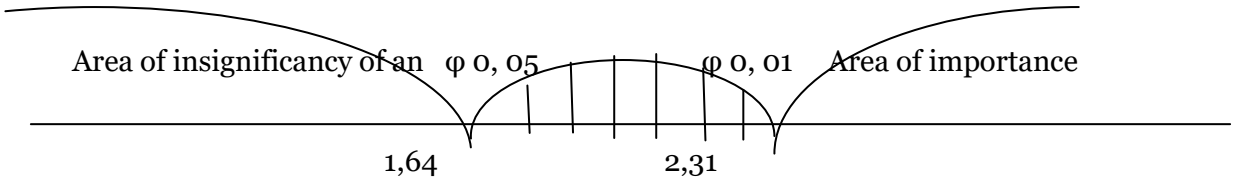


Fig. 1. The Axle of the importance of professional design thinking of students on the lesson to design at the beginning of the experiment.

A control slice in the course of the experiment at the end of the 2nd course showed the effectiveness of the innovative blaze-method in the development of professional design thinking of students. Students 14 people, and this 63.6 % of the experimental group enrolled on Blaise-method when solving the design task, which showed a good level of professionalism of the design projects.



Answer: φ*EMP = 1.877

Fig. 2. The axis of the importance of professional design thinking students during the test cut of the pilot study at the lesson design.

In the control group, 7 (35 %) of the 20 who were trained by traditional methods, showed average and high results. From these figures it follows that the empirical value of φ* is in the area of uncertainty and is equal to 1,877, when H_0 is rejected, noted on the axis of significance of figure 2. At the end of the pilot study that students in the control and experimental groups performed final qualification job, to substantiate on the design concept and executed design project. The final project that was exhibited at the defence of graduation qualification work, evaluated according to the criteria noted in table 1.

Table 2. The results of the final phase of the pilot study assessing levels of development of professional design thinking of students in learning design

Group	"There is an effect": the problem is solved	"No effect": the problem is not solved
	Number of test subject	Number of test subject
1 the experimental group 22 person (100 %)	21 (95.5 %)	1 (4.5 %)
2 control group 20 people (100 %)	12 (60 %)	8 (40 %)

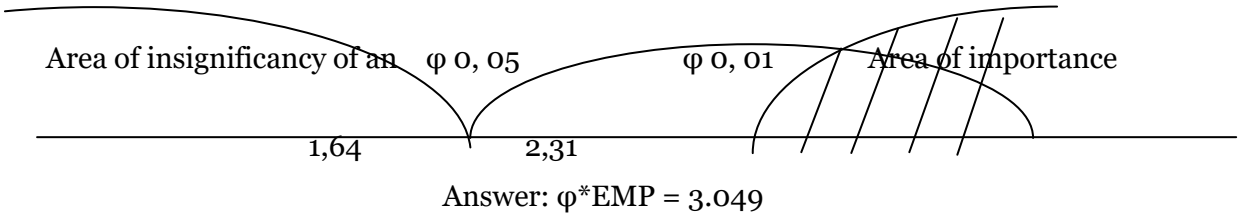


Fig. 3. The axis importance of professional design thinking of the students of the final stage of experimental research at the lesson design.

The results of the final phase of the experiment, at data processing and to identify the empirical values of angular transformation of Fisher's equal 3.049, the value of which is indicated in table 2 and presented in figure 3. Thus, the obtained empirical value of the angular conversion of Fisher's φ* is in the area of significance. In the experiment, the obvious process of the development of professional design thinking of the students, using innovative blaze-method when solving the design task showed the most pronounced qualitative and professional level of design projects.

Thus, the effectiveness of an innovative Blaise – the method of development of professional thinking of students in the field of design proposed by the authors, convincingly demonstrated, as evidenced by the data of the research results by the authors ' criteria (table 1).

The results of experimental studies of the effectiveness of an innovative Blaise – the method of development of professional thinking of students, future designers have convincingly shown in the comparative characteristics of the stages of the development process at the beginning of the experiment, the control slice at the end of the second year of study and at the conclusion of the experiment. This is clearly reflected in the figures of the axes of the significance of professional design thinking of students.

This fact additionally reveals and emphasizes the novelty of this research.

4. The discussion and conclusion

The authors' research confirmed the initial hypothesis about the need to incorporate innovative, blaze-the method of development of professional design thinking of the students in the process of University education.

The results of the study led to the following conclusions.

1. In contemporary world education is changing towards a more holistic harmonious personality, who is fluent in logical and imaginative thinking.
2. Analysing scientific works separate aspects of the problems of innovative methods of development of professional design-thinking of the students, it turned out that was not sufficiently explored of with psycho-pedagogical point of view. One of the methods of solutions presented to the question is revealed in this article that emphasizes scientific and theoretical significance and relevance of the study.
3. The authors performed scientific-theoretical justification of the features of development of professional design-thinking of students and the defined parameters of the evaluation on three main blocks corresponding figuratively-creative, volumetric and spatial, and project-creative thinking.
4. Developed and experimentally tested an innovative, blaze-the method of their development, which is the technology of the output of the personality alpha-level, achieving an alpha state, aimed at the mentality of creative, harmonious brain functioning, development of professional thinking. Determined the value and quality of this blaze-method.
5. Experimentally proved that the basis for the development of professional thinking of students are practical skills of entering the alpha state, in which the students actively the way find solutions to professional, creative and scientific tasks.
6. In the process of solving scientific problems were determined novelty, theoretical significance and practical value of this research, which consist needed for inclusion in the higher education system of modern innovative psycho-pedagogical Blaise-method of development of professional thinking of the individual in the field of design.
7. The results of testing prove conclusively the effectiveness of an innovative Blaise-method of development of professional thinking of the students. This stresses the novelty of the carried-out work and reiterates the confirms needs for implementation to the system of higher education of student designers the present blaze-method.
8. In General, this study has important practical significance. On its basis it is possible to develop scientific-methodical recommendations for students and teachers of universities in training future designers. This will contribute to the dynamics of qualitative growth of development of professional thinking of the students. The results, outlined in this article, can be the basis for further research in the development of professional design thinking of students.
9. In the study, solved largest pedagogical task is the development of professional thinking of the students, which is of great high social value. Contained in the article theoretical positions, conclusions and practical recommendations create the preconditions for the pedagogical of scientific support for improving the professional thinking of future designers in modern conditions of higher education.

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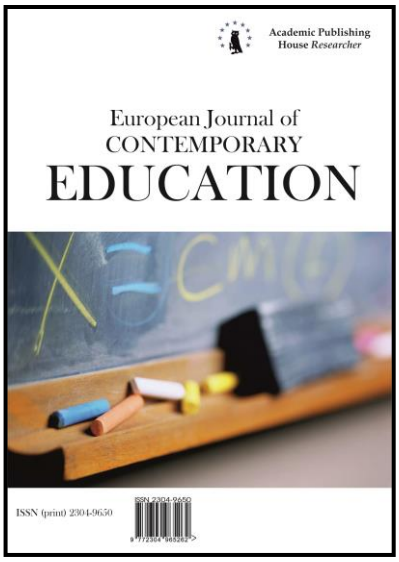

A Computer Test as a Means to Assess Formation of the Teacher's Metasubject Competences

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Abstract

In the article here is up-to-dated the problem of creation and implementation of the complex system on measurement and assessment of the teachers' competences. Here are presented approaches and approbations of the computer test as a means to assess formation of the teacher's metasubject competences on the example of researching of the group of teachers working with gifted children and youth. Here is revealed the theoretical basis of the competence-based approach, its basic concepts – competence and competency, metasubject competence. The level of methodological bases readiness of the competence-based approach in the aspect of organization of the pedagogical measurement process of the teacher's professional competences is provided. The review of a number of methods and means to assess the teacher's competences is presented, features of the computer competence-based oriented test as a special complex evaluation means are presented, which will provide detection of deficits of the teacher's professional competences and will allow creating conditions for development its realization in the teacher's professional activity of its cognitive, behavioural and valuable components. The description of the computer test is provided: approaches to develop the system of test tasks, determination of their contents, forms and options of representation, results of testing, working conditions with a set of tasks. Screenshots of some pages of the computer test are shown, the operation algorithm, approaches to formation and interpretation of the basis of statistics, the form of presenting recommendations on work with testing results are described. Results of the test approbation on the group of 96 teachers working with gifted children and youth are provided. The subject of testing is a cluster of the teacher's metasubject competences including communicative, research, motivating, organizing, information,

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creative, tutorial, methodical competences and the self-improvement competence. Analysis results of tests are provided in the aspect of mean scores, generalized characteristics of formation of teachers' competences and also generalized characteristics of professional deficits, which respondents have. In outputs of the article the conclusion is made that the offered computer test allowed not only evaluating the level of formation of competences, but also to define teachers' professional deficits and to reveal measures to eliminate these deficits.

Keywords: competence-based approach; competence; competency; a teacher's metasubject competences; the teacher working with gifted children; estimated methods and means; computer testing; a competence-based focused computer test.

1. Introduction

In realization of modern personnel educational policy a question on formation and assessment of a certain set of the teacher's professional characteristics, promoting high-quality realization of the pedagogical activity, is becoming more and more urgent. To replace a simple set of knowledge, skills nowadays new concepts appear such as a competence-based approach – "competence", "competency", in general as a new direction in scientific and pedagogical methodology. Purely "knowledge" education is already inefficient and inexpedient (Zimnyaya, 2004). Competences are necessary not only to form, but also to estimate. Now, despite rather full readiness of the competence-based approach theoretical base in the educational process, there is a problem of creating and introducing a complex system of measurement and assessment of teachers' competences (Zolotareva, 2016).

The interest to the problem of a competence-based approach in the Russian scientific community, especially in recent years, is increasing (V.I. Baidenko, I.A. Zimnyaya, T.M. Kovaliova, Yu.G. Tatur, A.V. Khutorskoy, etc.) (Baidenko, 2005; Zimnyaya, 2004; Kovaleva, 2003; Tatur, 2004; Hutorskoi, 2003). The competence-based approach appeals to a modern paradigm of cross-disciplinary education, it is considered as some kind of instrument to strengthen a social dialogue of the higher school with a professional world (V.I. Baydenko) (Baidenko, 2005); it focuses attention on the result of education, and the result is not considered to be the sum of the acquired information, but the person's ability to work in different problem situations (D.A. Ivanov, K.G. Mitrofanov, A.V. Sokolova); the result is revealed through a set of different competences (Yu.G. Tatur) (Tatur, 2004).

Competences, as a set of the personality's interconnected qualities (knowledge, learning skills, ways of activity), set in relation to a certain circle of objects and processes, and which are necessary for high-quality productive activity in relation to them, being presented in behaviour, the person's activity, become his personal qualities, properties, become competences. Competences are characterized with both motivational, and semantic, and relational, and regulatory components, along with cognitive (knowledge) and experience. According to leading scientists' researches, working in this field (I.A. Zimnyaya, V.D. Shadrikov, I.G. Galamin, etc.), the teacher should have a certain set of competences characterizing him as a person and expert (Zimnyaya, 2004). The level of formation of competences is to be diagnosed and measured.

The measuring procedure is offered to be a set of empirical operations (a choice of the measurement subject, a choice of empirical referents, a choice of measuring procedures, constructing and use of measuring tools, a scale choice, making a display of measurement results on the scale, the analysis and interpretation of measurement results) allowing to set estimates of the measured characteristics and to present them in the quantitative or qualitative scale. According to the most widespread definition, given by American psychologist S. Stevens in 1946, measurement is a procedure of attributing numbers to some characteristics of objects according to certain rules. In empirical sciences all estimating characteristics have generally a latent (hidden) character, preventing from direct measurement. Owing to latency not characteristics by themselves, but their empirical referents – observed signs of characteristics are under estimation (Chelishkova, 2011). Inevitable latency of variable measurements, which used to be in education levels of mastering of knowledge and learning skills, and nowadays competences, leads to the necessity to check adequacy of the received estimates of a conceptual variable of measurement and accuracy of estimates, that is provided due to correction of properties of the measuring instrument.

The correct organization of the pedagogical measurement process is quite important as any mistakes of the standardized conditions of carrying out, processing, the analysis and interpretation

of measurement results decrease validity and accuracy of the received estimates. In case of the organization of the process of assessment of the teacher's professional competences it is necessary to follow these step-actions:

1. To reveal a whole set of competences according to requirements to a pedagogical position and the performed labour functions, set with relevant normative documents (the professional standard, FGOS VPO (Federal state educational standard of higher professional education), etc.);
2. To integrate competences into clusters (to develop a cluster or competence-based model, a cluster structure);
3. To describe signs of cluster demonstration or a certain competence of the future professional activity (competitive knowledge, learning skills, valuable orientations, etc.);
4. To develop competence-based oriented tasks for assessing each cluster or competence;
5. To find evaluation means, which is adequate to task logic for assessing competences.

2. Materials and Methods

To assess the teacher's competences it is possible to offer a certain number of estimated methods and means: pedagogical and competence-based tests; a case method (English Casemethod, a case method, a case-study, a method of certain situations, a method of situation analysis); the situational, integrated and practice-focused tasks; a portfolio (a selection of the certified achievements, the most significant works and reports on them); project tasks, etc. (Zolotareva, 2014).

However, a rather difficult assessment procedure of the teacher's competences assumes development of a more special complex estimated means which will provide identification of deficiencies of the teacher's professional competences and will allow creating conditions for demonstration development of the teacher's professional activity of its cognitive, behavioural and valuable components. Such estimated means may be a computer competence-based focused test (Razumova i dr., 2016).

Implementation of the competence-based approach is happening with transition from traditional testing to the testing developed on the basis of the theory of pedagogical measurements (psychometrics, the Item Response Theory, testology) (Zolotareva, 2014). The test is understood as a set of the control tasks in the standardized form, which have necessary backbone statistical characteristics and provide reliable and valid estimates of the conceptually chosen the measurement variable. The definition of the test has requirements to its quality, which are absent in traditional evaluation means. The radical difference of the test from normal tasks consists not in the form of representation of questions and responses, but that it is based on the theory of pedagogical measurements in the process of its creation and application, and that allows receiving a number of the important advantages, which are absent when tests are not used (Chelishkova, 2011).

Competence-based tests for assessing the teacher's professional competences should contain competence-focused tasks with a freely constructed answer, it is desirable it should be of the interdisciplinary character, on use of knowledge in the subsequent training, life or professional situations. They are developed within the criteria-oriented approach or for each competence, or for each cluster of competences.

The base of the computer test, described in this article, is the case method (English Casemethod, a case method, a case-study, a method of certain situations, a method of the situation analysis) – the technology of training and assessment using the description of real educational situations. The teacher should analyze a situation, understand the essence of problems, propose possible solutions and choose the best ones. Cases are based on real actual material or are brought closer to a real situation (Neiman, 2000). A characteristic feature is submission of ambiguous information on this problem, which can be based on real life facts, material sources, etc. The case is not just a truthful description of events, but the unified information complex allowing to understand the situation (Ansimova, Zolotareva, 2016).

The test for assessing competences is developed as a computer test for teachers and is approved by of SAI FPE of the Yaroslavl Region "Institute of Education Development".

The description of the computer test (further – the Test):

- the system of test tasks is developed for the whole set of learning skills (experience, actions) or abilities presented in passports of competences;

- the content of test tasks includes knowledge, describing each competence, and is directed to assess external demonstration of having it (actions) and abilities to use the competence in practice;

-to assess one competence there are from 20 to 25 developed test tasks;

-to assess each skill (experience) or ability – not less than 2 test tasks (in different options of assessment);

-the set of test tasks provides a free choice of a set of tasks in different variants (to avoid repetition of test tasks in different testing situations – at self-assessment, entrance test, assessment of formation of the competence after the course of advanced studies, the delayed test, etc.).

The free choice of tasks is provided with the testing computer programme. Generation of the Test is carried out by the choice of a certain quantity of tasks from the category (categories) with their reordering in a random order.

The test task contains:

- a single question on assessing one of abilities or skills (actions, experience) of this competence; the question is the formatted text of the case (a pedagogical situation) to demonstrate the ability or skills of this competence;

- the task offers 5 possible answers according to the chosen type of answers; variants contain answers of the different competence extent (abilities or skills): wrong, partially correct, correct;

- each possible answer contains the assessment - 0, 1, 2 (0-incorrect; 1 - partially correct; 2 – correct)

- each possible answer has estimating recommendations (a formatted short text – what the teacher can do, cannot do, what else he should learn, master within the content of this test task), which a tested person will receive after passing the whole test.

If an examinee hasn't done a task, he can't pass to the following test task. When the examinee answers the last question, the button will change the name to "Finish".

Results of testing:

- each examinee gets assessment Grade Point Average on each competence, characterizing the level of its development (below basic; basic; advanced);

- each examinee can receive the list of recommendations, containing the text of estimates and recommendations according to the choice of answers on each competence.

On completing the test there will be a page, where will be presented the test name, summary result of passing, result on each competence (if there are some) and recommendations, corresponding to answers to questions.

Results of testing are the personified data and are available only to the examinee. It is possible to save them in the html file, pressing the button “Save”, or to print, pressing the button “Print”. To transit to the main menu it is necessary to click "Return to the homepage".

Testing results are supposed to be used for formation of a statistics basis (data collection on the held sessions of testing and their analysis): storage of complete (with keys of answers) results of passing the test by Users and a possibility of its export to the xls and/or csv format.

Statistical results of testing are available to each User, represented by the educational organization, which has the name and the password of access to the testing system. The User's representatives (administration or methodical service) can analyze data, as for assessing the level of competences development by pedagogical employees of the educational organization, which are necessary for work with gifted children and youth, and for determining teachers’ deficiencies in development of these competences.

According to testing results the administration of the educational organization can make a decision to make an application for professional development of teachers in order to remove these deficiencies (Ansimova, Zolotareva, 2016).

3. Discussion

96 teachers working with gifted children and youth took part in approbation of the test. The assessment subject was teachers’ metasubject competences.

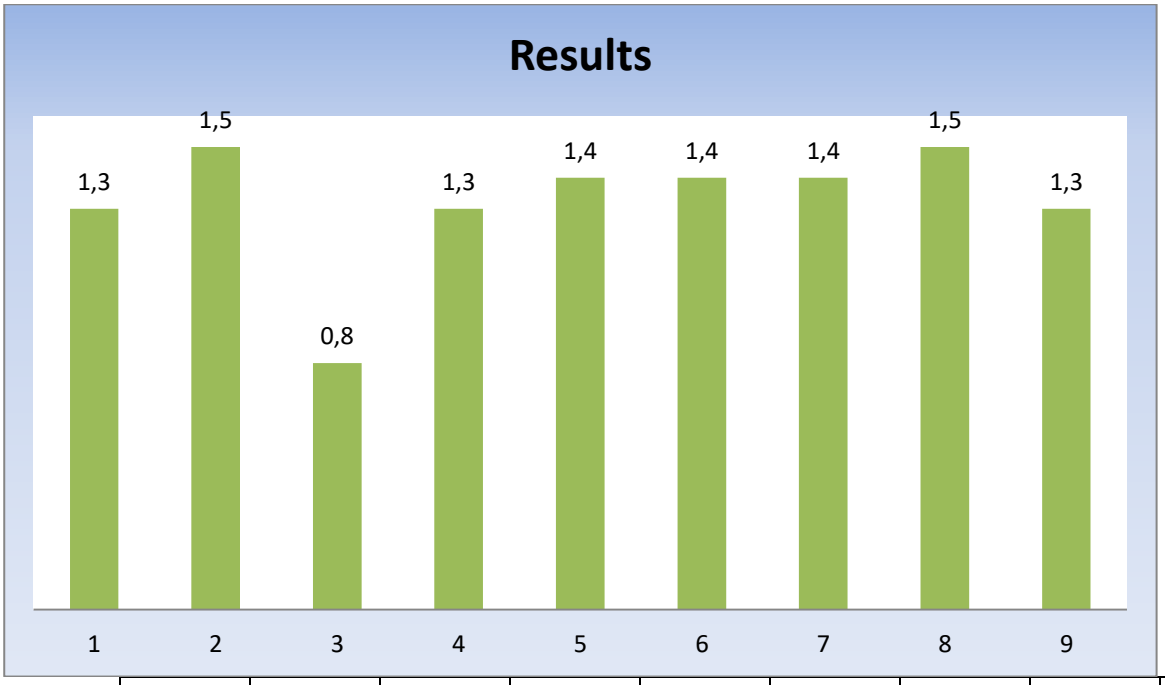
The teacher’s metasubject competences are understood as the universal abilities and readiness of the teacher, promoting to achieve metasubject results in work with children.

Professional competences of the teacher, working with gifted children, are characterized by the general metasubject properties, such as:

- many sidedness of knowledge and open mindedness allowing the teacher to be beyond the professional activity;
- universality, polysubjectivity and polyfunctionality of the skills used in different spheres and areas;
- fundamental nature of knowledge, skills, their thoroughness, which is a base for successful development in life and in the profession;
- the qualities of the new type identity characterizing it as a flexible, mobile, competitive individual, who can be successful and effective in dynamically developing society (Muhamedyarova, 2016a, 2016b).

The cluster of the general professional metasubject competences of the teacher, working with gifted children, included the following competences (competencies): communicative, research, motivating, organizing, information, creative, tutorial, methodical, self-improvement competence (Ansimova, Zolotareva, 2016).

The figure 1 presents the GPAs, gained by examinees on each competence.



	1	2	3	4	5	6	7	8	9
Competence	Communicative	Creative	Tutorial	Information	Methodical	Research	Self-improvement	Organizing	Motivating
Result	1,3	1,5	0,8	1,3	1,4	1,4	1,4	1,5	1,3

Fig. 1. GPAs, gained by teachers on each competence

The test assumed that the examinee could gain 0, 1 or 2 points on each of components of this or that competence. Thus, we see that dispersion of estimates of competence formation is presented by teachers who passed test in range from 0,8 to 1,5. It is also important to note that the distribution of values for each scale is normal, which was established during the Kolmogorov-Smirnov test (Kolmogorov-Smirnov Z $p>0,05$). The obtained result allows us to speak about sufficient representativeness of the sample when organizing the test development procedure. The research and motivating competence have the greatest values of points, it is supposed to be logical for teachers who work with gifted children and youth (Chi-Square = 15,68, $p = 0,05$). However, on this background, a rather low level of creative competence (0,8 points) raises questions.

We shall pass to the more detailed analysis of components of competences, considered by us. We will pay attention that testing results allowed us not only to estimate the level of competence

formation, but also to define teachers' professional deficiencies and measures to remove these deficiencies.

The analysis of results of the communicative competence formation shows GPA – 1,3, i.e. it is formed at the level slightly above the average one (it is possible to consider it as a satisfactory result), at the same time, some dispersion of points on its components (from 0,6 to 1,8), speaks about the different level of their development. This result should be considered reliable from the standpoint of the normality of the distribution of the results obtained during the survey. The Kolmogorov-Smirnov test is statistically insignificant (Kolmogorov-Smirnov Z $p > 0.05$). We recall once again that the distribution of values over the remaining scales also corresponds to the normal form. So, the ability to influence the gifted child is adequate to the purposes of communication and problems of the joint activity, and most teachers have it at the average level and it demands additional development. Testing results do not allow us to assume that examinees have a high level of formation of the ability to operate the process of communication with gifted children, showing the ability to take their views, purposes and features into account.

The analysis of respondents' answers demonstrates that they have insufficiently created the ability to solve communicative problems of gifted children, they should correlate the strategy of communication to features of the gifted child, considering his age, a type of endowments and another. At the same time, it is necessary to look at the communicative problems arising in the course of communication of gifted children more widely. Teachers need to develop the ability to solve gifted children's communicative problems, paying attention that it is important not only to defuse the conflict, but to transfer it to the course of the situation contributing to his talent development.

Examinees' skills of interaction experience with various groups of gifted children (different in age, status, a kind of activity, etc.) is at the average level and demands additional development. Probably, the experience which is available for the tested teachers is insufficiently various. The ability to use skills to work with various means of communication in different types of the professional activity in working conditions with gifted children is at the level above the average one and is getting closer to the good result. This block of the communicative competence least of all needs special additional development. However, it indicates that it is necessary to develop the teacher's Information and Communications Technology competences.

Therefore, it is relevant to include into professional development programmes questions of communication process management of the teacher with the gifted child, goal-setting in the organization of the joint activity process of the teacher and gifted children and also the choice of means of influence on this child, adequate to goals and the child's interests. In programmes of professional development it is necessary to provide the methods, directed to motivate teachers to expansion and variety of the teacher's experience on interaction with gifted children (a case method, Portfolio, a teacher's presentations, etc.)

The average value on research competence was 1,5 points, that shows a rather high level and demonstrates that most of respondents have it. However, there are components, which points are at the average level, are basic for the teacher's research competence and therefore need additional development. It is possible to refer to these abilities such as search of necessary and qualitative resources for research projects, to find and involve investors in realization of results of gifted children and youth's research activity; make recommendations to gifted children on carrying out researches; to have skills on technologies of the organization of research laboratories and etc.

Therefore, in programmes of professional development it is necessary to provide questions of theoretical and methodical support of students' research activity; to acquaint them with new material equipment of the educational activity, technospheric technologies; development of the teacher's enterprise competence, skills to attract investors and introduce gifted children's research developments in activity practice; and also questions of design and organization of students' research laboratories.

Due to the general GPA (0,8) the creative competence is at the lowest level in the cluster and, certainly, requires additional development. Including a study of the personal qualities defining creativity; organization and implementation of the educational process of the creative type, possession of creativity development technologies and activation of the gifted child's innovative thinking; creation of favourable psychological climate for creative self-realization of the gifted child; ability to make own creative products, but not fruits of somebody's work. The programme of teachers' professional development can be devoted to bridge these professional deficits.

Assessment of the tutor's competence has shown a rather good indicator (1,4 points), which characterizes teachers' readiness and ability to realize pedagogical support of gifted children. At the same time it is necessary to pay attention to development of those abilities, which are at the average and slightly above than the average one levels. Such as choice of means of forming the talented student's request for the educational activity; use not only traditional, but also innovative technologies of supporting of gifted children's development, helping him to set individual purposes and to solve individual problems; formation of the teacher's subject position in interaction with students; search of educational resources; assessment of results of the tutor's support. Therefore there is a sense to include into professional development programmes the whole range of questions of teacher training in realization of the tutor's position.

Teachers' organizational and administrative competence has gained high GPA (1,4), however "the ability to distribute and organize work of gifted pupils at the lesson and in extracurricular activities" seems to be quite significant, and has an extremely low GPA (0,95). Besides, some other components of other abilities are at the average level, and that requires additional attention to their development anyway.

Examinees define the leading forms of developing skills of independent acquisition of students' knowledge correctly, plan individual work with the gifted child correctly within all contents of the educational programme to the subject, can control the way of realization of objectives set to pupils, as well as in educational, and extracurricular activities. At the same time examinees should study more attentively forms of organization of gifted pupils' independent work; ways of training of gifted pupils for competitions, Olympiads and other forms of competitions; ways to split up talented pupils' work (0,95 points).

Having analysed testing results of the information competence, it is possible to draw a conclusion that in general it is at the level above the average one (1,4 points), that examinees rather successfully use a technique of choosing the content, using navigation technologies and search of necessary information in the Internet, possibilities of multimedia, choose correctly the equipment for the experience presentation. Teachers do not use only their experience, but also programme and Internet products opportunities for preparing didactic and methodical materials. Examinees know possibilities of information technologies use and can orient in search of information scientific resources.

But, at the same time it is necessary to use possibilities of new information technologies more actively, which allow developing gifted children and youth's mental abilities (for example, the online magazine, spreadsheets, electronic on-line portfolio, Wiki – technology, etc.); it is better to study questions concerning information accumulation about actions with use of information resources. The revealed contradictions allow us to think that there is need in additional work on development of this competence. It is necessary to include the questions concerning practical development of the certain new information technologies, applied in information search, the organization of gifted students' research and design activity, preparation of didactic and methodical materials in professional development programmes.

The teacher's motivating competence in general is formed at a very high level (1,5 points). Examinees in general can attract interest of gifted children in the subject, can show gifted children's progress to parents and also can effectively choose tasks so that gifted pupils may feel success; can build activity at the lesson taking into account the level of educational motivation development, besides they have a great range of material and tasks, which can attract gifted students' interest to various topics of the taught subject. At the same time, they should learn to make various conditions allowing to involve talented children in additional forms of knowledge to the subject; to make an individual educational route with children, basing on requirements and interests. Thus, except some components it doesn't require special additional attention.

The teacher's methodical competence (1,3 points). The analysis of testing results allows seeing that teachers own abilities to develop educational programmes; know what pedagogical technologies due to the nature of interaction must be applied in work with gifted children and youth; know quite good the types of methodical production, promoting introduction of the most effective methods and forms of work into the educational practice; can choose methods to unite the group of gifted children and youth.

However, they should know better who and how carries out psychological and pedagogical support of gifted children and youth; what body in the structure of the educational organization

management is responsible for coordination of programme and methodical ensuring work with gifted children and youth; to master forms of generalization and distribution of pedagogical experience; instruments for developing talented children and youth's mental abilities and also to know better how to define the personal need of talented children and youth and what pedagogical technologies provide training of gifted children and youth to public presentations and debatable discussions. They should know better what diagnostic technologies allow tracking results of talented children and youth's creative development.

In general the methodical competence is formed at the level slightly above the average one (1,3 points), however there are a lot of results of indicators which are at the average level. Therefore, there is a need to give special additional attention to this competence. The revealed deficiencies must be in the programme of additional professional education of the teachers working with gifted children and youth.

The GPA on the self-education competence (1,3 points) could be considered satisfactory, however, attention is drawn with extremely low knowledge of specifics of the teacher's self-education during the work with gifted children and youth (0,6 points), and lower knowledge of features of self-control of the self-education and self-improvement process (0,5 points). Nevertheless high points on questions of the self-analysis of their professional activity and also understanding by teachers conditions of self-education efficiency, give the grounds to believe that the situation with this competence can be improved in case of teachers' additional training. Teachers are in great need in studying self-education subjects, features of self-control of the self-education and self-improvement process, development of reflexive abilities.

4. Conclusion

Use of the competence-based focused computer test allows receiving results describing an overall picture and drawing a conclusion that respondents have the competences not at the highest level, which are necessary for work with gifted children and youth. Study of logical blocks of abilities (where there is the corresponding gradation) and a component structure of competences allowed determining professional deficiencies or, on the contrary, seeing strong sides of examinee-teachers. By results of the research the modular programme of teachers' professional development will be worked out, where topics will be offered in modules, revealing approaches to remove teachers' professional deficiencies. We also note that the results, obtained and the analysis performed on the scales, indicate the reliability and validity of the developed test. This makes it possible to use the test in solving many applied problems in education.

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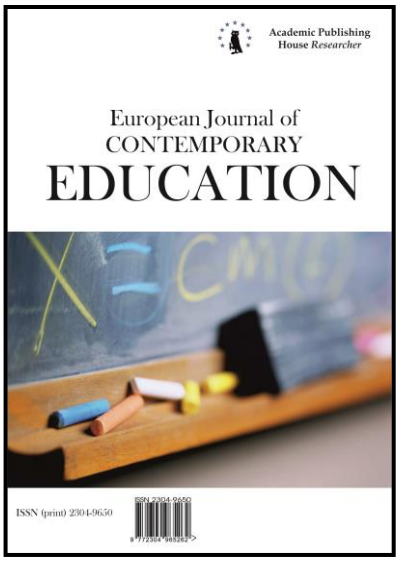

Social Communication as the Means of Preschool Children Education: Research and Development Opportunities

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Abstract

The article reveals the problem of developing the ability of preschool children to socialize. It covers the theoretical aspects of the issue and draws attention to the association between the social communication of preschool children and their ability to interact and intercommunicate as well as the development of their social and emotional intelligence, motivation, etc.

The article describes methods and methodology for the study of four components of the process of social communication among preschool children such as socio-intellectual, activity-practical, motivational-axiological and emotional. The article considers the following sections of the program which allows forming effective social communications in preschool children: «Socialization. Life skills».

There are represented the results of the experimental research of social communications among preschool children in different educational environments (school, kindergarten, developing center of additional education). The dynamics of the development of the capacity of preschool children for social communications and the changes in their social and communicative personal qualities in the process of experimental work are shown.

The article deals with the discussion issues of the creation of conditions for the development of effective social communications in children. The author substantiates the necessity of creating a developing educational environment for teaching preschool children, the use of the project method, the interdependent form of play activity in group work with preschool children, analysis and

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evaluation of this process by teachers and psychologists. It is also noted that developing centers for additional education of children have opportunities for the implementation of this process.

Keywords: social communications, the social situation of development of preschool children, the psycho-pedagogical program.

1. Introduction

In connection with the changes in the social situation of the development of the child of preschool age, which is associated with the limited number of children's contacts, the lack of a multi-age socialization in the yard, and the communication in virtual rather than real space, the interest of researchers in studying the features of social communications among children has increased.

Modern philosophical studies consider social communications as a universal system of interaction of agents in the socio-cultural space on the basis of the processes of creation, exchange, storage and translation of cultural values, in which a person creates a special kind of communicative niche – social communication (Buzskaya, 2014). In the course of the mediated interaction of subjects, three main goals are achieved: broadcasting and appropriation of knowledge (cognitive), inspiring the social communication participants' actions (stimulating), receiving and expressing emotions (expressive) (Orekhovskaya, 2014). It is important that in the process of social communication, there is a "transition from the speaking of One to the actions of the Other" (Konetskaya, 1997). On the basis of social communications there take place the social adaptation and the identification of the subject in the society.

The interest of a person in the social world is already clearly manifested in pre-school children (Zakharova, 2011). The senior preschooler is able to accept and learn information from other people in a relatively autonomous way, solve elementary problems of interaction with peers and adults, respond emotionally to events in his life. The picture of the social world, formed by a preschool child and his opportunities in the development of social communications not only affect the development of his personality, but also significantly increase the level of adaptation during the transition from a pre-school educational environment to the educational environment of the mainstream school.

L.V. Kolomiychenko regards social communications in preschool children as a dynamic, consistent and multi aspect process that promotes the child's becoming a subject of social culture (Kolomiychenko, 2015). The scientist believes that the main mechanisms for the development of social communications in preschool children are: social orientation, reflex regulation, imitation, emotional identification, normative and inductive regulation, social experience, cultural creation, control, evaluation and reflection.

Discussing social communications among older preschoolers, researchers pay attention to the fact that social intelligence contributes to this process being an integral ability to understand the actions of a partner in communication and a factor of interaction with the social environment, which ensures successful social adaptation of the child (Mikhailova (Aleshina), 1996).

Social communication is also viewed in the activity-practical aspect, in particular from the point of view of possibilities of influencing the game interaction of preschool children and their peers, their communication, and its role in creating special social and communicative situations for the successful implementation of the process (Veraksa, 2014; Samokhvalova, 2015). In addition, researchers point to the possibility of using the subject-generative and subject-joint types of interaction in the development of social communications in preschool children (Panov, 2014).

Turning to the motivational-axiological aspect of social communication in preschool children, scientists emphasize that it is difficult for a child to choose between personally significant and socially significant motives, that the hierarchy of motives as a relatively stable manifestation of personality is earlier formed in children with a higher socio-psychological status (Belkina, 2015).

Researchers point to the emotional aspect of social communication in children and view it through the development of the child's emotional intelligence, that is, his ability to differentiate his own feelings, the initial ability to control them, the understanding of the emotional states of communication partners, etc. (Andreeva, 2008).

In the process of social communication, preschool children develop social skills, which in their turn are influenced by a favorable atmosphere in the group of children, positive relationships with teachers and peers he interacts with. The assimilation of social and moral

cultural rules of public life and the realization of moral norms are achieved through playing the with the help of educational games which take into account gender differences, etc. (Singer, 2007; Johansson, 2006).

Summarizing all of the above, we can say that by developing a child's social communication skills, we meet the child's need for the other, and ensure his successful entry into the society. At the heart of this development there is the mastery of ways to cognize the elements and systems of other people's behaviour, the positive motivation in interaction with them, an adequate assessment of one's own emotional state and that of the communication partners (Antopolskaya, Zhuravleva, 2016).

The problem is to determine the conditions under which preschool children will be more successful in implementing social communications.

2. Materials and Methods

In the experiment on the development of social communications in pre-school children, three groups of preschool children aged 6-7 years took part. The children were in different educational environments.

We assumed that social communication will be more effective in that organization where the educational environment is that of a creative type and children are engaged in a special psychological and pedagogical program that forms social and communicative skills. Preschoolers of this group will be involved in various forms of play activity and communication which are based on the subject-generative and the subject-joint types of interaction.

We investigated four components of the process of social communications: social-intellectual, activity-practical, motivational-axiological and emotional. There are psychodiagnostic methods used in the experiment: the "Social Intelligence" test (J. Guilford, M. Saliven, adapted for the Russian-speaking E.S. Mikhaylova (Aleshina), the hardware method of modeling the joint activity "Arka" (A.S. Chernyshev, S.V. Sarychev), "Methodology for determining the degree of involvement of older preschool children in play interaction with a peer" (S.S Zhuravleva), "Emotional persons" (N.Ya. Semago), "Scheme of monitoring the communication of children in different types of joint activities "(R. Beyls, adapt Ya.L. Kolominsky, E.A. Panko), "Communicative-personal questionnaire" (R.S. Nemov), Socio-metric method of J. Moreno (in the modification of T.A. Repina), method of expert evaluations ("Questionnaire of definition type of social and communicative interaction of older preschool children in gaming activities "(V.I. Panov, S.S. Zhuravleva).

The first stage of the study revealed the features of the educational environment in which preschool children were trained and determined the levels of their social communications. At the second stage of the study a shaping experiment was carried out. The independent variable was the specially created psychological and pedagogical conditions and the implementation of the program "Socialization. Life skills" among preschoolers, the dependent variable being the level of social and communicative development of children.

The psychological and pedagogical program "Socialization. Life skills" was established and then piloted during 5 years in order to create conditions favorable for effective social communications among preschool children. It was conditionally divided into three parts: specially organized training in the form of classes; joint activity of the child and an adult: designing, project activities, preparation and participation in interactive festivals; free independent activity of children: socio-dramatic plays, designing, artistic creativity. The contents of the program included the following sections:

- "The secret of my own self": living through various emotional states, gaining experience of dealing with one's own sensations, emotions and feelings and those of another person; forming gesture culture in children and the ability to express their thoughts and feelings through facial expressions; creating safe environment for self-knowledge and understanding of one's own self and individuality; developing adequate self-esteem.

-"Me and the other. The world begins with me ": organization of game activity in accordance with the age development, learning game interaction, formation of social skills while communicating with peers.

- "This strange world of adults": the formation of the foundations of arbitrary behavior, emotional-volitional regulation, mastering the rules of adequate safe behavior in society.

- "I'm learning to be a pupil!": Acquainting children with the conditions and nature of educational activities at school, the formation of primary skills of learning, the formation of a positive attitude towards school and adaptive behavior in the transition to a new level of education.

The forming stage of the experiment also included the involvement of all the subjects of the organization in the work on the implementation of the program; actualization of the subject-generative and subject-joint types of interaction in the course of practical classes with children; analysis and evaluation of results on the part of teachers and psychologists.

3. Results

According to the ascertaining stage of the experiment children from control group № 1 had the dogmatic type of the educational environment as prevailing. In the second organization (kindergarten), engaging the children of the control group 2, the career educational environment prevailed. In the third organization (the developing center for additional education "Dialogue", Kursk), where preschool children from the experimental group were trained, a typical creative environment prevailed.

The results of the experimental work revealed a significant dynamics in the development of preschool children social communications ability.

Table 1. Dynamics of socio-communicative development of preschool children

Components of the socio-communicative development	CGr 1			CGr 2			CGr 3		
	The beginning of the academic year	The end of the academic year	t, p	The beginning of the academic year	The end of the academic year	t, p	The beginning of the academic year	The end of the academic year	t, p
socio-intellectual	2,8	3,6	6,212***	2,86	4	10,258***	3,1	4,6	9,326***
activity-practical	2,45	2,78	8,569***	2,67	3,2	7,105***	2,55	4	11,989***
motivational-axiological	3,26	3,86	4,123***	2,97	3,46	3,623***	3,15	4,45	10,257***
emotional	3,65	3,93	6,797***	3,21	4,1	8,524***	3,4	4,91	11,942***
Straight average, scores	3,04	3,54		2,93	3,69		3,05	4,49	
Educational effect			10,00			15,20			8,80
Positive shift			46			56			69
Negative shift			2			1			
Zero shift			30			21			

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Zero shift			30			21			9

Notes
* Statistically invalid differences (p≥0,05);
** Statistically verifiable differences (p<0,05);
*** Statistically verifiable differences (p<0,01).

We elicited the highest for this age group level of the emotional component of social communications development – 78.6 %; low level of the activity-practical component development (55.6 %, i.e. 2.67-3.2 points); the average level of the development of socio-intellectual (76 %, i.e., 2.86-4 points) and motivational-axiological components (71, 2 %, i.e. 2.97-3.46 points). In the experimental group, the number of children with an above-average and high levels of social and communicative skills development has increased significantly.

In the course of the experiment, we determined a change in the socio-communicative personal qualities of children.

Table 2. The expert assessment of socio-communicative qualities of children CGr1, CGr2 and EG (%)

Socio-communicative qualities of preschoolers	CGr1	CGr2	EG
Kindness	90, 2	93,8	95,5
Consideration	48, 4	65	81,2
Honesty	59,5	70	86, 2
Politeness	82, 5	69, 4	88, 4
Sociability	92, 3	70,6	81, 2
Generosity	87	49, 4	72, 4
Sympathy	79,3	63, 1	95,5
Fairness	58,6	60, 6	88, 4
Cheerfulness	89, 2	61,3	95,5
Responsibility	35,1	67,5	65, 4

The expert assessment of socio-communicative qualities of children CGr1, CGr2 and EG showed that the majority of preschool children possess sufficiently marked qualities of kindness, sympathy, sociability, fairness, cheerfulness, politeness, consideration and honesty. The results of the development of these qualities are equally high in the three study groups, but in the CGr1 the indicators of the consideration and honesty are slightly reduced, as well as those of cheerfulness and politeness in CGr2.

The results of the formative stage of the experiment demonstrate statistically significant differences in CGr1, CGr2 and EG in terms of the level of development of social communications. ($t=2,421$, $p <0.05$ – for groups of CGr 1 and EG; $t = 2,726$, $p <0,01$ for groups CGr2 and EG), the emotional component ($t = 3,856$, $p <0,01$ for groups CGr1 and CGr2, $t = 2,512$, $p <0, 05$ for CGr1 and EG groups, $t = 4,225$, $p <0.01$ for KG2 and EG groups).

In particular, the statistical differences in the development of the socio-intellectual component ($t =3,253$, $p\geq0.05$ – for groups CGr1 and CGr2, $t=5,128$, $p <0.01$ – for groups CGr1 and EG, $t =3,245$, $p <0.01$ – for groups of CGr2 and EG); the activity-practical component ($t =5,363$, $p <0.01$ – for groups CGr1 and CGr2, $t =4,124$, $p <0,01$ for groups CGr1 and EG, $t =4,986$, $p <0$, 01 for groups CGr2 and EG); the motivational-axiological component ($t =3,741$, $p <0.01$ – for t groups CGr1 and CGr2, $t =3,236$, $p <0.01$).

4. Discussion

Discussing the development of social communication in children, researchers draw attention to the fact that in different educational environments, there are differences in conditions that ensure successful social communication among preschool children. This is proved by our experimental work.

Scientists draw attention to the fact that socio-communicative development of the child is most successful in developing centers of additional education for children. It is there that conditions are provided to meet the needs of the individual: to be as the next man (identity with the surrounding world); be a personality (the desire for self-determination); to be different (searching for opportunities to go beyond the boundaries of one's self) (Frishman, 2014; Yasvin, 2001). At the

same time, a number of opportunities these organizations present for a child's development contribute to the successful entering the social world:

- flexible, creative forms of organizing classes and activities;
- diversity interaction subjects;
- the possibility of carrying out "social tests" in the nearest microcommunity;
- the predominant role of play motivation in the organization of communication and interaction of children;
- the possibility of choosing a teacher and that of parents' being present at the lessons.

Developmental educational environment is essential for forming social communications of preschool children. It should have characteristics of a creative type of environment (Yasvin, 2001), i.e. create opportunities for free development of the child's personality. Such an environment encourages the actualization of the processes of interaction, communication, intensification of communicative, intellectual and behavioral components of play activity, development of the subject position of the senior preschooler in interaction with a peer. Such kind of environment may be called a social oasis, which changes the personality of a child and the children's group (Chernyshev, 2007).

It should be borne in mind that a specially created developmental educational environment not only provides a successful solution to the problems of the age-related development of the preschooler, but also promotes the actualization of the zone of his nearest development, the realization of conditions for free activity in the peer group and joint activity with the adult as well as has a positive impact on the emotional state of the child and takes into account the gender differences of children. Under the conditions of a specially created developmental educational environment, acquired in the result of integrated pedagogic actions, children get interested in communication and begin to feel a need for it which contributes to forming co-operation skills, behavioral norms, skills of safe behavior in society and other socio-communicative skills.

Experimental work has confirmed that one of the productive methods of teaching preschool children social communications is project activities. N.E. Veraksa points out that it is the project method that is the main condition for encouraging activity and initiative in children of the senior preschool age (Antopolskaya, Zhuravleva, 2016). Project activities are classified as integrative methods and imply the foreseeing of the result of joint project activity while being initiated and implemented by children themselves on the basis of common interest. In the course of project activities, children acquire the experience of productive interaction in a group of peers, which causes changes in their interpersonal relationships as well as the nature of their relationship with parents as partners in shared experiences. The presentation of the project activities results and their appreciation by adults and other children is an essential condition of personal development of the child.

In the course of the experiment the following stages of the project proved themselves: preparatory (deciding on the topic, methods and outcome of the forthcoming activity; goals and objectives setting,); principal (independent performance of the work); preparation for project defense; defense; evaluation (by external experts). Psychologically, the process of working on a project is more important than its result, because it allows you to master the "new" forms of human activity in a group of peers. Deciding on the issue of the project is related to the implementation of the "three questions model" (What do I know about the object-matter of the project? What do I want to discover? What needs to be done to get this information?). Projects can be short-term and long-term. At the initial stage of the project implementation, preschool children discuss the content and the sequence of the forthcoming work and distribute assignments within the group. The realization of even short-term projects makes parents, teachers of additional education, musical directors, recreational gymnastics instructors and art tutors be involved in active interaction with children. During the forming stage of the experiment, the following projects were prepared: "Me and Others", "I am Going to School", "Safety Area", etc.

An important method of teaching preschoolers effective social communications in our experimental work was finding solution in difficult communicative situations (what you could do if your group mates need help, what can be done to resolve a conflict situation between two children, what you should do if the adult offended you, etc.). Solving these situations does not aim at demonstrating the communication skills of dealing with peers and adults that have already been learnt and they do not have the only correct solution. While solving them, preschoolers learn to

interpret the situation, to choose an adequate way of dealing with the problem. Thus comes the change in personal agency of preschool children, i.e. transition from the subject-object type to the subject-generative type of children interaction within their group. Preschoolers learn not only to settle situations by themselves, but also master stereotypes of socially approved ways of communication with peers.

As demonstrated by our experimental work, the ways of organizing interaction in the group of preschool children are mechanisms that provide for the child's social and communicative development. In the experiment we employed the ideas of L.I. Umansky and his followers regarding forms of organization of joint activities of children (Chernyshev, 2007). From our point of view, these forms can be described as follows. The essence of the joint-individual form of interaction between subjects is in fulfilling a common task by all actors simultaneously, but each of them makes its part of the common work independently of each other. The joint-sequential form of interaction is based on the relay or conveyor mode, i.e. the result of activity of one subject becomes the object of activity of the other. The joint-interdependent interaction form is more complex in terms of its organization, as the task is carried out with direct (simultaneous and within the same space) involvement of each subject with all the rest. From our point of view the use of interdependent form of play activity in group work with preschoolers allows making teaching children social communications most effective.

It is crucial that children are given clear meaningful goals and the adult puts the child into a positive frame of mind when it comes to communication with peers analyzing and discussing some issues and arranging the joint activity of children. The adult also creates conditions for independent choice and personal contribution to the result of mutual play activity. It should be mentioned that the development of the child's personal agency through play interaction with a peer is supported by his emotional-axiological excitement about the overall result of the activity.

Such activities as playing games based on dramatization, doing training exercises, composing and acting out stories, improvising, playing active theme-based games, making socio-dramatic play more complicated and plot building help to strengthen socio-communicative skills.

One of the important conditions for the socio-communicative development of senior preschoolers is the analysis and evaluation of this process by educators and psychologists. It is these subjects that not only record the quantitative and qualitative changes in the mental development of children in the educational process, but also the changes in the interaction of children in the peer group.

5. Conclusion

Thus the theoretical analysis of the problem of development of the capacity of preschool children for social communication and the experiment which has been carried out allows us to state that:

- this problem is of an interdisciplinary nature, there are different points of view on its understanding;
- the solution of the problem will increase the adaptive capabilities of preschool children needed during the transition from a pre-school educational environment to the educational environment of the mainstream school;
- there are pedagogical conditions that facilitate the process of teaching preschool children social communications: the creation of an educational environment of a creative type; the use of various forms of play activity and communication among preschool children on the basis of the subject-generative and subject-joint types of interaction; realization of the psychological and pedagogical program of social and communicative development of children.

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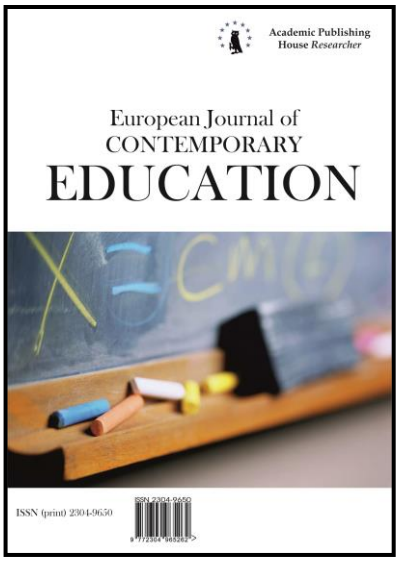

The Use of Metacognitive Reading Strategies among students at International Burch University: A Case Study

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Abstract

Being notably absent from many classrooms and largely unaware of by many language learners, metacognitive reading strategies have attracted a keen interest of scholars and have been extensively researched in very diverse contexts. Thus, the primary goal of this research is to determine the overall usage of different types of metacognitive reading strategies by non-native English language speakers *at International Burch University*. For that purpose, the Metacognitive Reading Strategies Questionnaire (MRSQ) was employed. The research sample was composed of 140 university-level students studying in two different fields, namely the field of English Language and Literature and Management. The analysis revealed that gender, grade level and study field have a significant effect on the use of metacognitive reading strategies, whereas the effect of nationality on the overall use of metacognitive reading strategies as well as on both of their subtypes is insignificant. Such research findings might largely contribute to a better understanding of different factors impacting reading strategy usage and might help teachers control them and act accordingly. Thus, some possible causes of such results are further explored in the current study and recommendations and directions for similar future field-related research are offered.

Keywords: Reading comprehension, metacognitive reading strategies, L2, analytic reading strategies, pragmatic reading strategies, correlation.

1. Introduction

A profound understanding of text is not acquired automatically, by second or foreign language learners in particular, but is gained gradually by relying on the use of reading strategies, specifically defined as 'deliberate, goal-directed attempts to control and modify the reader's efforts

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to decode text, understand words, and construct meanings of text' (Afflerbach et al., 2008: 368). These self-regulating actions which include planning, monitoring and evaluation are crucial to the reading process, as they increase reading comprehension (Alexander, Jetton, 2000) and thus separate competent from incompetent readers (Paris, Jacobs, 1984; Pressley, Afflerbach, 1995; Sheorey, Mokhtari, 2001). However, self-regulation and strategic behavior accelerate not only the process of reading but the overall learning process, as they enhance attention, memory, communication and learning and ensure development in diverse curricular areas (Paris et al., 1991). Thus, heightened strategy awareness eventually leads to an independent, successful and effective learning process (Anderson, 1991; Chamot, 2005; O'Malley, Chamot, 1990; Oxford, 1990; Pressley, Gaskin, 2006), the ultimate goal of education.

Accordingly, raising learners' awareness of strategy use is of immense importance and explicit strategy teaching ought to be accepted and inserted as a part of the curriculum and be present in the classrooms. This not being the case (Beck et al., 1989; Pressley et al., 1998), second and foreign language learners still struggle when processing texts in the target language, academic texts in particular, and commonly use wrong strategies (Wood et al., 1998). Hence, teachers nowadays ought to be trained as to how to accurately and effectively teach strategies and help their students become familiar with using different types of strategies. Since strategy use is related to reading ability (Baker, Brown, 1984), this will lead to students' better reading comprehension and consequently a greater academic success.

Bosnia and Herzegovina is a country with a long-established tradition of English language teaching (Buckingham, 2016). English is taught through educational institutions and the process begins in the first grade of elementary school and continues all the way till the end of formal education (Rizvić, Bećirović, 2017). Both receptive and productive skills are regularly practiced in the classroom, with reading skills being the second most practiced ones (Ogrić-Kevrić, Dubravac, 2017). Despite the fact that reading is such a prominent skill commonly practiced in the Bosnian educational milieu, the explicit teaching of reading strategies has not been part of the curriculum and the research in reading strategy use is rather scarce. Thus, this paper aims to explore whether students at *International Burch University* employ overall metacognitive reading strategies and their two subtypes while reading academic texts and whether some factors, such as gender, grade level, nationality and study field, exert a significant impact on reading strategy use.

2. Literature review

The classification of reading strategies, and learning strategies in general, has been a highly debatable issue, with various scholars proposing different classifications. A few classifications especially accentuate 'metacognition' as a very important aspect of using strategies, comprising the following components: planning and preparing for effective reading; making decision about when to employ a certain reading strategy; and having the knowledge on how to monitor, direct and evaluate the use of various reading strategy (Anderson, 2003: 10). Thus, O'Malley and Chamot (1990, pp. 44-45) classified strategies into metacognitive, cognitive and socio-affective, which are closely related to six types of strategies combined in two groups in Oxford's (1990) classification, namely direct and indirect strategies, where direct strategies include memory, cognitive and compensation strategies and indirect strategies metacognitive, affective and social strategies.

Metacognitive strategies, firstly mentioned in Flavell (1976) and defined as 'one's knowledge concerning one's own cognitive processes and products or anything related to them' (Flavell, 1976: 232), deal with 'planning, monitoring, and evaluation of language learning activities' (Oxford, 1990: 121). They include the awareness and conscious control of the learning process (Schraw, 1998) and are believed to be the most important factor in facilitating reading comprehension (Mokhtari, Reichard, 2002).

Various instruments have been used to explore the use of learning strategies, such as Strategy Inventory for Language Learning (SILL) (Oxford, 1989), and reading strategies in particular, such as The Metacognitive Awareness of Reading Strategies Inventory (MARSI) for native speakers (Mokhtari, Reichard, 2002), The Survey of Reading Strategies (SORS) for non-native speakers (Mokhtari, Sheorey, 2002; Sheorey, Mokhtari, 2001), as well as the Metacognitive Reading Strategy Questionnaire (MRSQ) (Taraban et al., 2004). MRSQ was developed to measure the use of metacognitive reading strategies, subdivided into two types, namely *analytic strategies* (*analytic-cognitive component)*, which pertain to cognition aimed at reading comprehension (Taraban et al.,

2004: 74) and *pragmatic strategies* (*pragmatic-behavioural component)* related to behaviours aimed at studying and academic performance (Taraban et al., 2004: 74).

The aforementioned instruments were extensively employed in various contexts, such as Indian (Taraban et al., 2013), Indonesian (Vianty, 2007), Iranian (Anjomshoaa et al., 2012; Tavakoli, 2014; Zare, Maftoon, 2014), Japanese (Shikano, 2013), Turkish (Cogmen, Saracaloglu, 2009; Solak, Altay, 2015), Spanish (Martinez, 2008) and have mainly shown that EFL learners use reading strategies to a significant extent, as the use was measured as either medium or high. The results of these studies have also clearly indicated that different factors have a considerable impact on the metacognitive reading strategy use, such as gender, study field, nationality, reading proficiency and have emphasized the need that these and other factors be explored further.

Gender related differences seem to have been thoroughly explored, but at the same time most highly inconsistent, as some studies point to a greater usage of strategies by female participants (Green, Oxford, 1995; Kaylani, 1996; Oxford, Nyikos, 1989; Razi, 2008; Sheorey, 2006; Poole, 2009; Phakiti, 2003), the others by male participants (Baily, 1996), whereas in some studies the differences exist only in the use of specific reading strategy types, with females using some strategies more than males and vice versa (Cogmen, Saracaloglu, 2009; Goh, Foong, 1997; Lee, 2012; Xu, 2004). The studies employing MRSQ instrument have also revealed opposing results. Thus, Razi's (2008) research into the use of metacognitive reading strategies by 205 Turkish university-level students revealed no significant difference in the use of strategies based on gender, as both female and male participants achieved the approximate mean score. On the other hand, Cogmen and Saracaloglu's (2009) study exploring 230 Turkish university-level students' use of analytic and pragmatic metacognitive reading strategies has demonstrated no significant difference on the analytic strategies dimension based on gender but a significant difference on the pragmatic strategies dimension, with females using pragmatic strategies more frequently than males.

The study field seems to be the other factor attracting the interest of many researchers (Oxford, Nyikos, 1989; Peacock, Ho, 2003) and it was shown to have a significant impact on the strategy use as the students in the field of humanities, social sciences and education appear to use more strategies than the students in the other fields (Oxford, Nyikos, 1989). The difference exists among the students in the field of humanities as well. The results of Cogmen and Saracaloglu's (2009) study have shown that the students studying at Turkish Language Teaching Department use reading strategies less frequently than the students studying at Fine Art Education and Primary Teacher Education Department, with the difference between these two groups being significant on the pragmatic strategies dimension and insignificant on the analytic strategies dimension. What is more appealing is that the students studying at English language departments appear to exploit the reading strategy inventory more than the students at some other departments. For instance, Mochizuki's (1999) research into the use of reading strategies by Japanese students demonstrated that English language and literature students used compensation, metacognitive and social strategies more frequently than the science and agriculture students. Similarly, Rong (1999) and Peacock and Ho (2003) also showed that English language students use the reported strategies more frequently than the students in some other fields, such as mathematics, building, engineering, business and others.

The difference in the use of reading strategies based on nationality and study year was also exhibited earlier (Alhaqbani, Riazi, 2012; Anderson, 2002; Karbalaei, 2010; Oxford, Burry-Stock, 1995). Thus, Alhaqbani and Riazi (2012) analysed Asian and African students' awareness of reading strategy use and the findings revealed a significant difference between the two groups, as the African students achieved significantly higher mean scores than the Asian students. In addition, students' strategy use is said to increase with the increase in their study year, as the students from the upper classes are noticed to use more strategies than the students from the lower classes (Cogmen, Saracaloglu, 2009; Oxford, 1994).

3. The current study

In the largely underexplored Bosnian context, metacognitive reading strategies have not aroused a great research interest. In the surrounding countries, on the other hand, the awareness of metacognitive reading strategies has been explored a bit further (Kolić-Vehovec, Bajšanski, 2003; Mijušković, Simović, 2016; Stanojević-Gocić, 2016) as well as some of the factors affecting the strategy use. Those findings have revealed that teaching reading strategies enhances reading

comprehension and that language proficiency and academic achievement are key factors impacting strategy use, as the more proficient foreign language learners and the students with a higher grade-point average (GPA) tend to use strategies more frequently than the less proficient ones and the students with a lower GPA (Mikulec, 2016). Since, to our knowledge, no study addressing the impact of some other demographic factors on strategy usage has been conducted in the given context, the current study might yield a better insight into this topic and deepen the understanding of the factors that can affect and contribute to a greater strategy use and eventually to an enhanced reading comprehension.

Thus, the primary goal of this research is to determine the overall usage of different types of metacognitive reading strategies by non-native English language speakers *at International Burch University*. Aiming to take the matter even further, the study also seeks to explore the use of metacognitive reading strategies across different study groups, different grade levels, different nationalities and gender. Therefore, the following hypotheses were tested.

1. There will be a significant difference in the use of metacognitive reading strategies, including pragmatic and analytic ones, based on students' grade level.
2. The students studying at English Language and Literature Department use metacognitive reading strategies, including pragmatic and analytic ones, significantly more frequently than the students studying at Management Department.
3. Bosnian students will achieve a significantly higher score in the use of metacognitive reading strategies, including pragmatic and analytic ones, than Turkish students.
4. Female participants use metacognitive reading strategies, including pragmatic and analytic ones, significantly more frequently than male participants.

4. Research Sample

The research sample consisted of 140 student participants. The students involved in this study were selected through convenience sampling, a non-probability sampling technique in which the subjects involved are fully selected based on their accessibility and proximity to the researchers. Thus, the students studying at International Burch University, the most prestigious private university in Bosnia and Herzegovina, were selected. All the participants were undergraduate students at English Language and Literature Department 89 (63.6 %) and Management Department 51 (36.4), with 38 participants being the first-grade students, 35 the second-grade students, 30 the third-grade students and 37 the fourth-grade students. The respondents belonged to two national groups, thus 110 respondents were Bosnian students and 30 respondents Turkish students, among whom 54 were male participants (38.6 %) and 86 female participants (61.4 %). The exact description of the participants is provided in Table 1.

5. Instrument and procedure

The instrument used for data collection was the Metacognitive Reading Strategy Questionnaire (MRSQ) developed by Taraban et al. (2004). MRSQ measures two constructs: (a) the *analytic* cognition aimed at reading comprehension, and (b) *pragmatic* behaviors aimed at studying and academic performance. MRSQ consists of 22 statements, each of which uses a 5-point Likert scale ranging from 1 ("I never do this") to 5 ("I always do this") and participants choose one of the five responses (never, rarely, sometimes, often, and always). The validity of the instrument was confirmed by Taraban et al. (2004). The internal consistency reliability of MSRQ was assessed by means of Cronbach α coefficient, which was α =.86, α =.81 for analytic strategies and α = .77 for pragmatic strategies.

The data was gathered on the premises of International Burch University during March and April 2016. The questionnaire was distributed at the beginning of the class, and the participants were asked to read each statement carefully, circling the number indicating the frequency with which they use the reading strategy described in the statement, to be sincere in their answers and to respond to all the questionnaire statements. The questions were further clarified by the researcher where and when necessary. The maximum amount of time needed for completing the questionnaire was 20 minutes, in class and under the researcher's supervision.

Table 1. Descriptive analysis of participants

		N	Percent
Study Group	English Language and Literature	89	63.6
	Management	51	36.4
Nationality	Bosnian	110	78.6
	Turkish	30	21.4
Gender	Female	86	38.6
	Male	54	61.4
Grade level	First Year	38	27.1
	Second Year	35	25.0
	Third Year	30	21.4
	Fourth Year	37	26.4

6. Data Analysis

The collected data was analyzed using SPSS (v. 22) software packages. Firstly, the descriptive analysis including means, standard deviations (SD) and frequencies was performed. The internal consistency reliability of the scales was measured using Cronbach's alpha coefficients. General characteristics of the participants were summarized using descriptive statistics and the independent samples T-Test and one-way ANOVA were used to explore the differences in using metacognitive reading strategies based on grade level, gender, study field and nationality.

7. Results

A one-way between subjects ANOVA was conducted to compare the use of metacognitive reading strategies among students at different grade levels. There was a significant difference between the students at different grade levels F (3.136) = 6.23, p = .001, η^2 = .121. Post hoc comparisons using the Tukey HSD test indicated that the mean score for the first-grade students (M = 3.54, SD = 0.51) was significantly lower (p = .05) than the mean score for the fourth-grade students (M = 3.61, SD = 0.49). Furthermore, the second-grade students (M = 3.34, SD = 0.58) used metacognitive reading strategies significantly (p = .023) less frequently than both the third-grade (M = 3.75, SD = 0.39) and the fourth-grade students (p>.001), (M = 3.83, SD = 0.49). Thus, the results indicate that the use of metacognitive reading strategies increases with the study year, the only exception being the second-grade students, who achieved a lower mean score (M = 3.34, SD = 0.58) than the first-grade students (M = 3.54, SD = 0.51). Therefore, these findings reveal that grade level has a significant medium, almost high, effect on the use of metacognitive reading strategies. The descriptive results, p value and effect size of metacognitive reading strategies, including their subscales based on grade level, are provided in Table 2.

Table 2. Descriptive results, significance, and effect size of metacognitive reading strategies based on grade level

Variable	First Grade		Second grade		Third Grade		Fourth grade		Total			
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	*p*	η^2
MRSQ	3.54	0.51	3.34	0.58	3.75	0.39	3.83	0.49	3.61	0.53	.001	.121
Analytic strategies	3.45	0.56	3.30	0.55	3.69	0.41	3.78	0.51	3.55	0.54	.001	.120
Pragmatic strategies	3.80	0.62	3.43	0.88	3.90	0.75	3.98	0.66	3.78	0.75	.011	.079

A one-way between subjects ANOVA showed a significant difference in the analytic reading strategy use F (3.136) = 6.210, p = .001, η^2 = .120. Post Hoc Tukey test showed that the fourth-grade students (M = 3.78, SD = 0.51) use analytic reading strategies significantly (p = .035) more than the first-grade (M = 3.45, SD = 0.56) and the second-grade students (p = .001) (M = 3.30, SD = 0.55). Furthermore, the third-grade students (M = 3.69, SD = 0.41) use analytic strategies significantly (p = .017) more than the second-grade students (M = 3.45, SD = 0.56). In addition, grade level has a significant effect on the use of pragmatic reading strategies as well, F (3.136) = 3.31, p = .011, η^2 = .079. Post Hoc Tukey test showed that the second-grade students use pragmatic strategies significantly (p = .020) less frequently than the fourth-grade students (M = 3.98, SD = 0.66).

Table 3. Descriptive results, significance, and effect size of metacognitive reading strategies based on study field

Variable	ELL Department		Management Department			
	Mean	SD	Mean	SD	*p*	*d*
MRSQ	3.79	0.45	3.30	0.53	<.001	.99
Analytic strategies	3.73	0.47	3.24	0.52	<.001	.98
Pragmatic strategies	3.95	0.66	3.47	0.81	.001	.64

An independent-samples t-test was conducted to compare the use of metacognitive reading strategies by the students studying at English Language and Literature Department and Management Department. A significant difference t (138) = 5.652, p < .001, d = .99 was found between these two groups of students, indicating that the study field has a significant effect, with the large effect size, on the use of metacognitive reading strategies. The students studying at English Language and Literature Department (M = 3.79, SD = 0.45) use metacognitive reading strategies significantly more frequently than the students studying at Management Department (M = 3.30, SD = 0.53).

Likewise, the study field has a significantly large effect on the use of analytic strategies t (138) = 5.558, p < .001, d = .98. The students studying at English Language and Literature Department (M = 3.73, SD = 0.47) use analytic strategies significantly more frequently than the students studying at Management Department (M = 3.24, SD = 0.52). Similar results have been obtained for pragmatic strategies t (138) = 3.802, p = .001, d = .64, but with the medium effect size. The students studying at English Language and Literature Department (M = 3.95, SD = 0.66) use pragmatic strategies significantly more than the students studying at Management Department (M = 3.47, SD = 0.81).

Table 4. Descriptive results, significance, and effect size of metacognitive reading strategies based on nationality

Variable	Bosnian students		Turkish students			
	Mean	SD	Mean	SD	*p*	*d*
MRSQ	3.616	0.56	3.615	0.43	.990	.002
Analytic strategies	3.55	0.56	3.56	0.45	.909	.019
Pragmatic strategies	3.78	0.80	3.75	0.59	.819	.042

An independent-samples t-test did not show a significant difference t (138) = 0.012, p = .990, in the use of metacognitive reading strategies between Bosnian (M = 3.61, SD = 0.56) and Turkish students (M = 3.61, SD = 0.43). When the use of analytic reading strategies was measured, similar results were obtained t (138) = - 0.114, p = .909, d = .019, with Bosnian students (M = 3.55, SD = 0.56) and Turkish students (M = 3.56, SD = 0.45) achieving a close score. As for pragmatic reading strategies, no significant difference was found t (138) = 0.230, p = .819, d = .042 between Bosnian and Turkish students. The aforementioned results indicate that nationality does not have a significant effect on the overall use of metacognitive reading strategies including its subscales.

Table 5. Descriptive results, significance, and effect size of metacognitive reading strategies based on gender

Variable	Female		Male			
	Mean	SD	Mean	SD	*p*	*d*
MRSQ	3.75	0.47	3.39	0.55	<.001	.70
Analytic strategies	3.66	0.51	3.37	0.54	.002	.55
Pragmatic strategies	3.98	0.64	3.45	0.81	<.001	.72

Moreover, an independent-samples t-test was conducted to explore gender-based differences in the use of metacognitive strategies. The results revealed a significant difference t (138) = - 4.088, p < .001, d = .70 in the use of metacognitive reading strategies between female students (M = 3.75, SD = 0.55) and male students (M = 3.39, SD = 0.55). This suggests that gender has a significant effect on the use of metacognitive strategies and that female students use these strategies significantly more frequently than male students.

Gender-based differences in the use of different types of metacognitive reading strategies were also significant. Thus, a significant difference was found in the use of analytic strategies t (138) = - 3.230, p = .002, d = .55, with the mean score achieved by female participants (M = 3.66, SD = 0.51) being significantly higher than the mean score achieved by male participants (M = 3.37, SD = 0.54). Furthermore, a significant difference was also measured in the use of pragmatic strategies t (138) = - 4.342, p < .001, d = .72, as the females (M = 3.98, SD = 0.64) use pragmatic strategies significantly more frequently than the males (M = 3.45, SD = 0.81).

8. Discussion and Conclusion

Due to an important role reading strategies have in the learning process, this study aimed at exploring their use across different study groups in the Bosnian context, deep in the heart of Europe, where English is used as an important means of communication and business transactions. The first hypothesis suggesting that there will be a significant difference in the use of metacognitive reading strategies, including the pragmatic and analytic ones, based on students' grade level is supported. The participants from the upper grade level use metacognitive reading

strategies, both analytic and pragmatic ones, significantly more frequently than the participants from the lower grade level. This is, to some extent, in line with Cogmen and Saracaloglu's (2009) results, since their results have shown that the study year impacts strategy use, as their fourth-year students used reading strategies more frequently than their first-year students. However, since the given difference was insignificant on the analytic strategies dimension, but significant on the pragmatic strategies dimension, these findings diverge from our research results which revealed a significant difference on both of these subscales.

The second hypothesis stating that the students studying at English Language and Literature Department use metacognitive reading strategies, both the pragmatic and analytic ones, significantly more frequently than the students studying at Management Department was also supported. The results showed that English Language and Literature Department students pay closer attention to the text they read, which enhances their reading comprehension. Such findings are fully aligned with previous research suggesting that the students majoring in English language and Literature use reading strategies more frequently than the students majoring in other study fields (Mochizuki, 1999; Peacock, Ho, 2003; Rong, 1999). A plausible reason for such results might be a greater English language proficiency of English language students. Being more proficient in L2 and consequently being more successful L2 readers, English language and literature students are expected to be more aware of strategy usage.

A slightly different situation arose with the third hypothesis which initially stated that Bosnian students will achieve a significantly higher score in the usage of metacognitive reading strategies, both the pragmatic and analytic ones, than Turkish students. However, since no significant difference was observed between Bosnian and Turkish students, who employ metacognitive reading strategies, including the two subscales, almost equally frequently, this hypothesis was rejected. This is rather unexpected since different national, culturally diverse groups were found to employ strategies with different frequency (Alhaqbani, Riazi, 2012; Anderson, 2002; Karbalaei, 2010; Oxford, Burry-Stock, 1995), with the difference in strategy use being in some cases statistically significant (Alhaqbani, Riazi, 2012). This might be explained by the fact that all the participants, Bosnian and Turkish alike, study at the same university, namely in the same educational milieu, where similar teaching approaches have been adopted.

The fourth hypothesis suggesting that the female participants use metacognitive reading strategies, both the pragmatic and analytic ones, significantly more frequently than the male participants was supported, as our female participants use both types of metacognitive reading strategies significantly more frequently than our male participants. These results are fully in line with extensive research revealing a greater use of reading strategies by females (Green, Oxford, 1995; Kaylani, 1996; Oxford, Nyikos, 1989; Razi, 2008; Sheorey, 2006; Poole, 2009; Phakiti, 2003). However, they diverge from the other studies employing the same instrument (Cogmen, Saracaloglu, 2009; Razi, 2008), which showed no significant gender-based differences in the use of strategies (Razi, 2008) or a significant difference on the pragmatic strategy subscale and an insignificant difference on the analytic strategy subscale (Cogmen, Saracaloglu, 2009). This seems to confirm the famous language learning folklore 'that women learn languages 'better' than men' (Oxford et al., 1988: 321) and that women are more motivated to learn English as a foreign language (Bećirović, 2017).

This study has some major practical implications. Our research findings can encourage instructors to implement metacognitive reading strategies into their syllabi, taking into consideration the differences that exist among the groups formed based on different factors. Thus, instructors can teach their students how to use metacognitive reading strategies correctly, directly stimulating them to read more effectively and thus accelerate the learning process.

This study aimed to explore the usage of metacognitive reading strategies by university-level students in the EFL context. Specifically, it sought to measure the central aspects of metacognitive reading strategy usage amongst students studying at two different departments, namely Management Department and English Language and Literature Department. The results revealed significant differences in the use of the metacognitive reading strategies between Management and English Language and Literature students, as well as between male and female students and grade levels. Nonetheless, this study proved that no significant differences exist in the metacognitive reading strategy use between the students of different nationalities, i.e. Bosnian and Turkish students.

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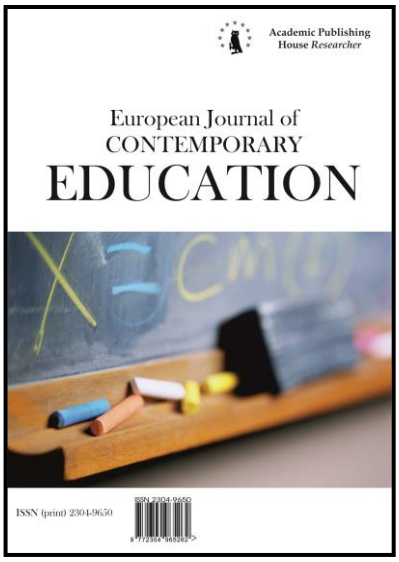

The Organization of Social Education in Paul Natorp's Creativity

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Abstract

The interest in a problem of social education amplifies in the period of considerable changes in society. It is not casual as it substantially causes nature of development of society, influencing process of socialization of younger generations, formation of mechanisms of transfer of social experience and traditions. Social and pedagogical approaches find special relevance in Russia from the second half of XIX – the beginning of the XX centuries that corresponded to a universal tendency of formation of social pedagogics as areas of independent scientific knowledge. The purpose of article consists in the characteristic from modern positions of the organization of social education in works of the famous German philosopher, teacher Paul Gerhard Natorp (1854-1924). Culturological, historical-comparative, system approaches are leaders in the characteristic of this problem. The judgment of social and pedagogical, cultural and historical experience testifies that the term «social pedagogics» was introduced into scientific circulation by P. Natorp in the work «Social Pedagogics». The interrelation of education and society promoted formation of social pedagogics. According to P. Natorp, society (community) is the main condition of education. And, on the contrary, education is the main condition of activity of society. Materials of article can be useful to organizers of educational work with school students, to teachers for acquaintance to historical experience of social education.

Keywords: Paul Gerhard Natorp, social education, education, the studying youth.

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1. Introduction

It is important to consider global processes and the phenomena of the modern world, change of arrangement of social forces of the different people and the states, mechanisms of their interaction at research of social education. In this regard formation of new ideas of the potential of the person, his essence and existence, abilities and requirements, individual and personal and social features, vital forces has basic value. These representations rely on known traditions of social and philosophical judgment of a problem, in particular, consideration of requirements and abilities of the person as integrated characteristics of his vital potential.

The appeal to history of social education connects us with achievements of social progress, accumulation of public wealth, the benefits, values of culture, knowledge at a boundary of the XIX-XX centuries. This circumstance demanded new knowledge and system of social education, ideas of social ideals, ways of their achievement. According to it socio-humanistic education which cardinally changes a lot of things in social education and training of pupils, is necessary new.

2. Materials and methods

Culturological, allowing to consider variety of the sociocultural phenomena, historical komparativistsky, system approaches made methodological base of research. They allowed to reveal intrinsic characteristics, the principles of the organization of social education, to prove the theoretical conclusion about expediency of this work.

Scientific and memoirs works of Paul Natorp, philosophical and pedagogical works of his contemporaries made source study base of work.

The complex of the methods complementing each other was used for the solution of objectives. It both the theoretical and comparative analysis, synthesis, comparison and classification, generalization.

The approach realized by us reflects unity of the main directions of the principle of historicism in historical and pedagogical science.

3. Discussion

Works of the German philosopher, teacher Paul Natorp, one of the most famous and considerable representatives of the international social pedagogics of the end of XIX – the XX centuries, takes a special place in world scientific and pedagogical heritage.

Popularity of the scientist and his contribution to development of the European pedagogics were estimated in the XX century by many researchers. According to S. Podoprigora, A. Podoprigora, awakening in the person of consciousness of internal freedom of creation of harmony individual and universal is the purpose of social pedagogics of P. Natorp (Podoprigora, 2013). The social pedagogics developed by it solved a problem of inclusion of the individual in infinite process of the movement to a social ideal in which the person is presented not as means but as the purpose (Podoprigora, 2013: 252).

Paul Natorp's works found a worthy assessment and recognition in domestic historical and pedagogical researches.

The considerable scientific and pedagogical baggage in the field of social pedagogics is so far saved up. Conceptual bases of social and pedagogical activity and its methodological justification are presented in works M. Vorobyev, A. Pertsev, V. Pimenov, N. Dmitriyeva, T. Dorokhova (Vorobyev, 2008; Pertsev, 2015; Dmitriyeva, 2008; Dorokhova, 2001).

The significant contribution to judgment of creativity of Paul Natorp was made by E. Sedova, D. Yakubovsky, N. Yaroshenko (Sedova, 2001; Yakubovsky, 2009; Yaroshenko, 2000).

4. Results

Concept «social pedagogics»

Regulations on the social nature of education, on optimum conditions of interaction of the growing-up child and society, on special pedagogical influence on the social environment in works T. Mor, Zh.-Zh. Russo, R. Owen, C. Fourier, I. Pestalozzi, T. Kampanella, A. Disterveg (Hessen, 1924).

But by the beginning of the XX century social problems of education within traditional pedagogics start being staticized. They start being discussed and investigated in various directions of sciences about the person.

The term «social pedagogics» was introduced into scientific circulation by P. Natorp in the work «Social Pedagogics». The first two parts of this book represent philosophical reasonings from neokantian positions and characterize a world outlook of the author (Natorp, 1911).

These parts of the composition represent regulations on ethics which can be considered also as social philosophy. As P. Natorp characterizes laws of social development, relationship of equipment, economy and the right, a public ideal.

P. Natorp stated the theory of house education, the theory of school and the theory of «free self-education» in general in the third part.

By the end of the XIX century the concept «social pedagogics» gradually became known. However it remained closely connected with intra pedagogical discussions about understanding of social pedagogics as social education of the person and education of bigger individual freedom, understanding of social pedagogics as answer to the social problems resolved by means of education.

When P. Natorp in the 1890th years started proving the concept «social pedagogics» during scientific discussions, he could not expect it future development. It remained for it all of the social philosophy which is also connected with area. Its understanding of social pedagogics as «education in society, through society and for society» destroyed a traditional view of education as the process, in effect, which is limited to interaction between two people (Natorp, 1911).

P. Natorp made bold to establish the social law of development. But it also meant also resolute criticism of the existing orders.

The individual and a community in P. Natorp's understanding

P. Natorp allocated three main components of social life in development of society:

- organization of work (development of productive forces of society);
- the political and legal organization (the main social and legal norms in society);
- the organization (that is a state) educations which are in close interrelation (Natorp, 1911).

In his opinion, progress of consciousness of certain people and all community in general is the main factor of progress. The term «community» meant not only society, but also association of persons which aspiration is directed to the uniform purpose. The individual consciousness is effectively formed in the atmosphere of human relationship. From here and new sense and problems of the «directed» social education. Education of the child in close interaction with the public acts as a basis of formation of the personality with a certain type of consciousness (Natorp, 1911).

The philosopher very closely connected production, political and pedagogical activity of people, staking on public national school.

The interrelation of education and society promoted formation of social pedagogics.

According to P. Natorp, the basic position of social pedagogics says: society (community) is the main condition of education. And, on the contrary, education is the main condition of activity of society (Natorp, 1914).

P. Natorp pays attention to the accounting of some ambiguities:

- the ambiguity in the relations of the concepts «individual» and «society» (community) having a wide circulation;
- non-compliance with distinctions between society (community) as idea and as the fact (Natorp, 1911).

In general Natorp's doctrine about education is based on understanding of pedagogics as the social directed and social and reasonable theory. Its understanding of social pedagogics as «education in society, through society and for society» remains actual and for modern development of this science.

The organization of education from P. Natorp's position

Education has the task to lead the individual to reunion with society, therefore, that the prevailing value has to remain always behind the objective and social point of view, - P. Natorp claimed (Natorp, 1911).

P. Natorp put «free self-education in a community of life of adults» in the center of the social and pedagogical concept. He emphasized that the person is not formed in itself, as separate unit of society. The community with other people does in real human life, he becomes the full member of society thanks to cooperation and «the mental relations». «The science about education has to

make important misses in performance of the task if does not regard as of paramount importance thought that without community there would be no education also» at all (Natorp, 1912).

P. Natorp assigned to will a crucial role as a peculiar psychological prerequisite of socialization of the personality («free self-education in a community»), considering as its special type of knowledge. It connects steps of activity of the personality («inclination», «will in close sense» and «reasonable will»), its moral as the main virtue with development of will. Thanks to will of people becomes a driving force of development of society (Natorp, 1911).

Therefore P. Natorp looked for justification of «the social organizations» for education of the will. He considered «house» (that is a family), school and «free self-education».

From modern positions its interpretation of «free self-education in a community of life of adults» is especially interesting. This improvement of the inner world in cooperation with adults, in connection with society and for society. Such concept at P. Natorp, is undoubted, filled with big pedagogical sense. «Education of itself, the person in itself is inexhaustible sense of all healthy youthful aspiration» (Natorp, 1914).

Therefore the people who received such education and «self-education in the spirit of a community», surely will become a bulwark of peace and democracies in society, will warn and will eliminate all possible for the social conflicts and revolutions, - P. Natorp considered (Natorp, 1911).

Altruism allowed P. Natorp to fill the concept with such measure of humanity that it gave the chance to allocate social pedagogics in one of the most progressive directions of pedagogical science.

The embodiment of ideas of socialization in practice of the western education occurred at the level of «free school». It is not casual. At the end of XIX - the beginning of the XX centuries the state control over schools was established and the requirement of education of law-abiding citizens was approved practically in all countries of Western Europe. The public school successfully solved this problem, but to the detriment of free social development of the identity of the child.

Therefore at the beginning of the XX century innovative pedagogical systems (M. Montessori, S. Frene, R. Steiner) arose as alternative to the state system in the different European countries. Their authors sought to create social identity at children. They saw a way of change of society in development of alternative schools (Merkulova, 2004).

Research of the level of social education of students

Ideas of social education of Paul Natorp are actual and now. Honesty, activity, pleasure of creativity, diligence in work, aspiration to work in public organizations which are brought up by social education, undoubtedly, are important for the modern young man.

Sociological research on problems of social activity and responsibility of student's youth of Southwest State University (Kursk), specialty psychology and sociology, was carried out by us in December, 2016.

64 respondents, among them: 7 men and 57 women, took part in research.

The questionnaire developed by youth council of statisticians of Central office of Rosstat for carrying out by the government the Russian Federation sociological research on problems of the Russian youth acted as tools (Questionnaire, 2011).

The block of the questionnaire «Political and economic orientations» was chosen by us. It represents for us the greatest importance (Questionnaire, 2011).

The following results were received.

The most part of respondents (81 %) is interested in succession of events in political and economic life of our country. 31 % watch development of political events. Meanwhile this information not always is for them interesting. It is also necessary to note that 16 % of students are not interested in events of everyday life. Other part of respondents (3 %) find it difficult to answer.

A half of students consider that their welfare depends on their own commitment and activity. 38% of respondents think that welfare is caused not only own efforts, but also living conditions equally. The percent of those who sees dependence of welfare on a situation in society, living conditions in it, is absolutely small.

The interesting moment is that 6 % of students consider that their welfare completely depends on a situation in society and living conditions in it.

According to most of respondents, the President of the Russian Federation deserves the greatest trust in modern Russia (86 %).

On the second place armed forces (army) (35 %) appeared. A quarter of respondents gave the preference to the Government of the Russian Federation (24 %), slightly more fifth part (21 %) of respondents voted for law enforcement agencies (police, prosecutor's office).

17 % of voices were given for national and national and cultural associations, other public and political forces gained approximately equal number of votes. Only 3 % trust heads of local governments (Table 1).

Table 1. What public and political forces in modern Russia deserve the greatest trust?

		Answers		Percent of
		N	Percent	
What public and political forces in modern Russia deserve the greatest trust?	Russian President	50	39%	86%
	Government of the Russian Federation	14	11%	24%
	Chief executive of the territorial subject of the Russian Federation	4	3%	7%
	State Duma of the Federal Assembly of the Russian Federation	6	5%	10%
	Federation Council of Federal Assembly of the Russian Federation	6	5%	10%
	Law enforcement agencies (police, prosecutor's office)	12	9%	21%
	national and national and cultural associations	10	8%	17%
	Mass media	4	3%	7%
	Heads of local governments	2	2%	3%
	Armed forces (army)	20	16%	35%
In total		128	100%	221%

Statistically significant dominates answer that the President of the Russian Federation V. Putin deserves the greatest trust ($p<0,001$).

In this regard, we can note that the President of the Russian Federation V. Putin is considered the worthy head in student's circles, his activity causes trust in student's youth.

Statistically significant ($\chi^2=110,62$; $df=6$; $p<0,001$) dominates answer that students are ready to address to law enforcement agencies at violation of the rights (Table 2). Students consider the appeal to official bodies of the power as lawful actions.

Table 2. What are you ready to undertake in case of violation of your rights?

		Frequency	Percent	Valid percent	Cumulative percent
The valid	anything as are sure of unsuccessfulness of any actions	6	9%	9%	9%
	to address to law enforcement agencies	38	59%	59%	69%
	to ask for the help in authorities	2	3%	3%	72%
	to participate in actions	6	9%	9%	81%
	to use a personal contact and remunerations	4	6%	6%	88%
	to draw public attention	6	9%	9%	97%
	I find it difficult to answer	2	3%	3%	100%
In Total		64	100%	100%	

We come to a conclusion that 13 % of respondents always take part in elections and do not pass them if to speak about such political activity of students as participation in elections.

According to students, following age groups: 30-45 years (44 %), 45-60 years (41 %) are the most politically active.

The most part answered (72 %) consider themselves as patriots (Table 3). This answer dominates statistically significant (χ^2=75,5; df=3; p<0,001). The concept «Patriot of Russia» includes, according to respondents, the following characteristics: love for the country (63 %), pride of great achievements of the country (56 %), in case of need protection of the country up in arms (50 %).

Table 3. Whether you consider yourself as the patriot of Russia?

		Frequency	Percent	Valid percent	Cumulative percent
The valid	yes	24	38 %	38 %	38 %
	rather yes, than is not present	22	34 %	34 %	72 %
	it is rather not, than yes	6	9 %	9 %	81 %
	is not present	4	6 %	6 %	88 %
	I find it difficult to answer	8	13 %	13 %	100 %
In total		64	100 %	100 %	

According to the interrogated students, the youth plays the following role in political life of Russia:

- serves in armed forces of the Russian Federation (45 %),
- participates in the state youth associations and the organizations (39 %).

Slightly less than a half of respondents (p>0,05) are the members of various organizations (44 %) most popular among those appeared: the sports organizations (21 %), clubs for interests (21 %), scientific, creative associations (21 %) (Table 4).

Table 4. Whether are you the member of any organization?

		Frequency	Percent	Valid percent	Cumulative percent
The valid	yes, political association	4	6%	14 %	14 %
	yes. national association	4	6 %	14 %	29 %
	yes, sports organization	6	9 %	21 %	50 %
	yes, club on interests	6	9 %	21 %	71 %
	scientific, creative associations	6	9 %	21 %	93 %
	yes, virtual associations	2	3 %	7 %	100 %
	Total	28	44 %	100 %	
The passed	System passed	36	56 %		
In total		64	100 %		

We come to a conclusion that more the student's youth of Southwest state university is interested in political and economic events. Welfare depends more on them. At violation of the rights students, in most cases, resort to the help of law enforcement agencies. The leading role of youth in political life consists, in their opinion, in service in armed forces of the Russian Federation. Activity of the Russian President enjoys the greatest confidence at youth, and the most politically active group is the age group of 30-60 years. Most of respondents consider themselves as patriots and put in this concept, most often, love for the country.

5. Conclusion

Paul Natorp made a powerful contribution to development of social pedagogics.

He speaks about self-improvement of the society having various deviations (alcoholism, crime, disintegration of a family) in the works. The social teacher has to know pedagogics and psychology, physiology of development of the child and a technique of educational work. This knowledge will help the teacher to study the child, to analyse his behavior. The social teacher has to be able to organize activity and cooperation of children.

P. Natorp spoke about it in the XIX century. In its works it is about formation of the skills of self-organization of society so necessary today.

According to P. Natorp, the social pedagogics has to cover all social levels, since a family and finishing with the state because «the purpose of the state is education to the highest humanity, and the purpose of education is formation of the true state» (Natorp, 1914).

The social pedagogics of Paul Natorp laid the foundation to development of science, actual for the present. Experts are necessary, able to cope with unforeseen life situations, capable to help people around to overcome difficulties, to keep themselves and to remain full-fledged members of society at any stage of its development.

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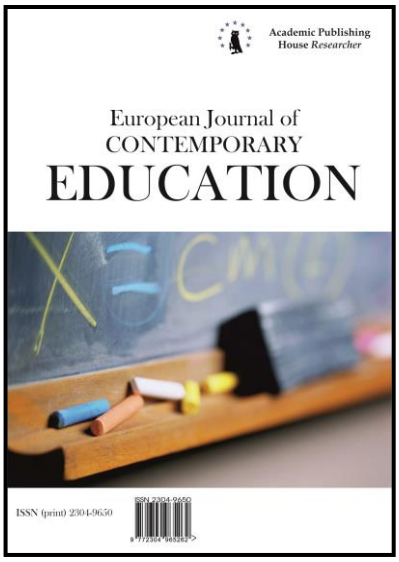

Attitudes and Preferences of Children Living in Orphanage Towards Physical Education Lessons

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Abstract

Background: The key factor that affects the success of shaping positive attitudes towards the regular life-long performance of a physical activity is the students' level of inner motivation. This is influenced, among other things, by their family background, the educational institution that they attend and the educator's competencies. *Objective:* The purpose of this study was to describe and analyse the attitudes of children (students) who are living in orphanage in physical education (P.E.) classes. *Method:* We analysed the data of 50 orphan students (22 boys and 28 girls, age 14.5 ± 2.13 years) attending the second stage of elementary schools in Slovakia. *Results:* P.E. is among the students who are living in orphanage popular teaching subject. Almost half of orphan students considered P.E. to be an important subject, expressed having high evaluation of their feelings and are assiduous during P.E. classes. They prefer mostly team sports. There were not any significant differences between orphan boys and girls with regards to their attitudes towards P.E. lessons, neither from the view of preferences in P.E. classes. We discovered that there were not any significant differences between boys and girls living in orphanage with regards to their attitudes towards P.E. lessons, neither from the view of preferences in P.E. classes. *Conclusion:* The present study suggests that P.E. teachers create a space to integrate orphan students among the other students to be fully socialised. This will increase the popularity of P.E. and allow physical activities to become a regular part of students' leisure activities. *The scientific paper was supported by grant projects VEGA nr. 1/0726/17 & 1/0242/17.*

Keywords: orphan students, physical activity, popularity, importance, feelings and effort.

1. Introduction

The most accepted definition of orphan is "a child who has lost both parents through bereavement. However, this definition is often extended to include the loss of parents through desertion or abandonment where the parents are unable or unwilling to provide for the child"

(Skinner, 2008). According to the joint report of UNICEF (United Nations Children's Fund), about 153 million children are orphans worldwide, 17.8 million of them have lost both parents. UNICEF estimates that at least 2.2 million children in the world live in orphanages (USG, 2010). Children living in orphanages are one of the most vulnerable groups of children in a society: many of them live in a state of repeated neglect, abuse or fear (Lassi et al, 2010; Sameena et al., 2016).

In the Slovak Republic is currently registered and certified about 90 orphanages, which are located approximately 4750 children and adolescents (Central Office of Labour, Social Affairs and Family, 2014).

In terms of education, even among children who are placed in children's homes in Slovakia for various objective reasons plays an important role in education through the prism of physical education, which at present has undergone many changes (Bendíková, 2016). School in both qualitative and quantitative terms has for the children in the children's homes one of the key position to influence their attitudes, beliefs and preferences of interest with regard to the implementation of physical activity (Štulajter, 2007; Bendíková, 2009, Dobay, 2015; Kolofík, 2015; Rozim, Marko, 2015). Researches in Slovakia do not only demonstrate general deterioration of physical performance and fitness of pupils, but also health oriented fitness (Labudová et al., 2012). This ultimately can have a negative impact on economy, health or social policy of country from various angles. Therefore, we believe that current transformation of the physical and sport education in Slovakia in the field of the education through modules creates a space for the pupils to prefer the physical activity for the health (Labudová et al., 2015), fitness and mainly meet the interests of the movement (Bendíková, 2014), by an active approach to their own health.

The purpose of this study was to describe and analyse the attitudes in orphan students attending the second stage of regular elementary schools in P.E. classes. A partial objective was to compare the attitudes and preferences for various physical activities by orphan students in P.E. classes.

2. Methodology

Participants

The research sample comprised 50 students (22 boys, height = 165.8±4.84 cm, weight = 58.3±4.1 kg; and 28 girls, height = 164.1±3.22 cm, weight = 52.6±3.9 kg; average age 14.5 ± 2.13 years) attending the second stage of regular elementary schools in Bytča (Slovakia). Table 1 shows the primary characteristics of the groups.

Table 1. Characteristics of the groups (n = 50)

Factors	N	Age	Height/cm	Weight/kg	BMI
Boys	22	14.1±1.92	165.8±4.84	58.3±4.1	21.3±3.5
Girls	28	15.2±2.22	164.1±3.22	52.6±3.9	20.1±2.4

Legend: BMI – Body mass index

Only those students who lived in orphanage were included in the research. Students were informed of the purpose of the research and the procedure for filling out the questionnaire, which was to be completed in the presence of their head teacher and the researcher. Consent of the legal representatives of the students at school regarding the students' participation in the study was obtained well in advance.

Data collection and data analysis

A non-standardized questionnaire was used to collect the data, of which five questions were selected that were related to the indicators of the popularity of P.E. (Antala, 2012). These questions included the importance of P.E., the students' efforts and feelings towards P.E., as well as preferences for various physical activities during P.E. classes. In four questions, the students who lived in orphanage, expressed their subjective opinions using a 5-degree scale (1 was the highest level and 5 was the lowest level of popularity). The lower the average value of the replies, the higher the attitude level. In the fifth question, the students could mark with circles a maximum of three sports that they most enjoy during the P.E. classes. The data were quantified on a percentage basis.

To carry out cross-group statistical testing of differences between boys and girls, we applied a ratio analysis with the help of the Chi-square test. The level of statistical significance was set to $p < 0.05$.

3. Results

Perception of physical education by orphan students

The results showed that P.E. is among the students who are living in orphanage popular teaching subject when they marked P.E as very popular (36 %) and popular (36 %). Only 8 % of students living in orphanage had dislike of this subject (Figure 1). The level of popularity of P.E. was stated by orphan students by 2.00 of the point score.

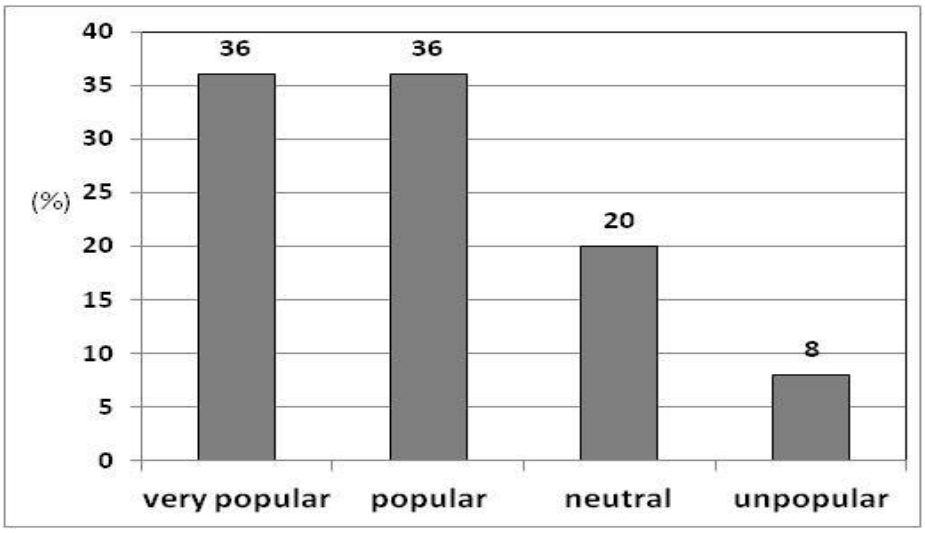

Fig. 1. Popularity of P.E. among students living in orphanage (n = 50)

The results further showed no statistically significant ($p > 0.05$) difference in the popularity of P.E. from the point of view of the respondents' gender. When comparing the differences between boys and girls, boys (54.5 %) marked P.E. as their favourite subject. 14.3 % of girls stated they had a dislike of this subject (Figure 2).

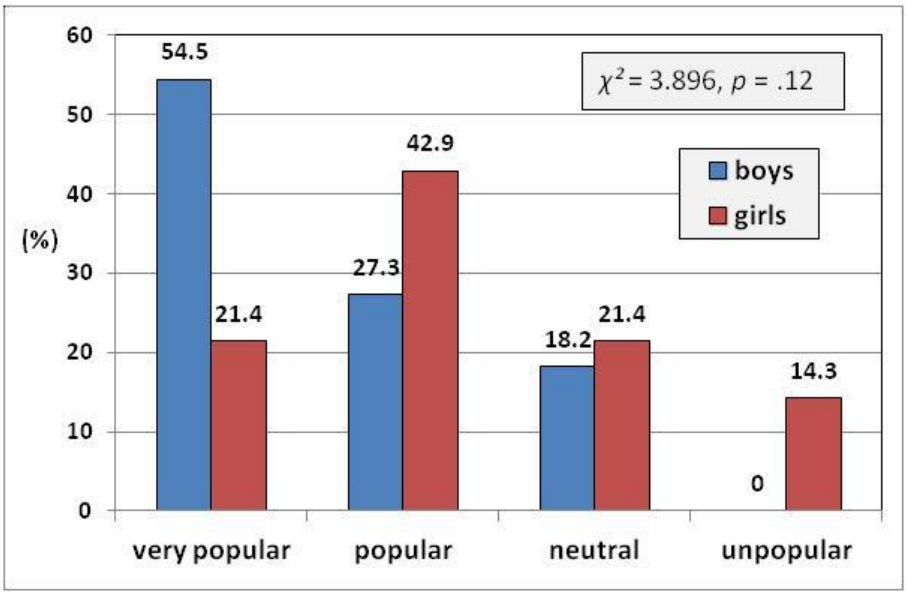

Fig. 2. Differences in P.E. popularity between boys (n = 22) and girls (n = 28)

Importance of physical education among students living in orphanage

40 % of students living in orphanage considered P.E. to be an important subject, 24 % took a neutral and 28 % of students living orphanage even negative view. Only 8 % of the students from orphanage considered P.E. to be very important teaching subject (Figure 3). The level of importance of P.E. was stated by students living in orphanage by 2.72 of the point score.

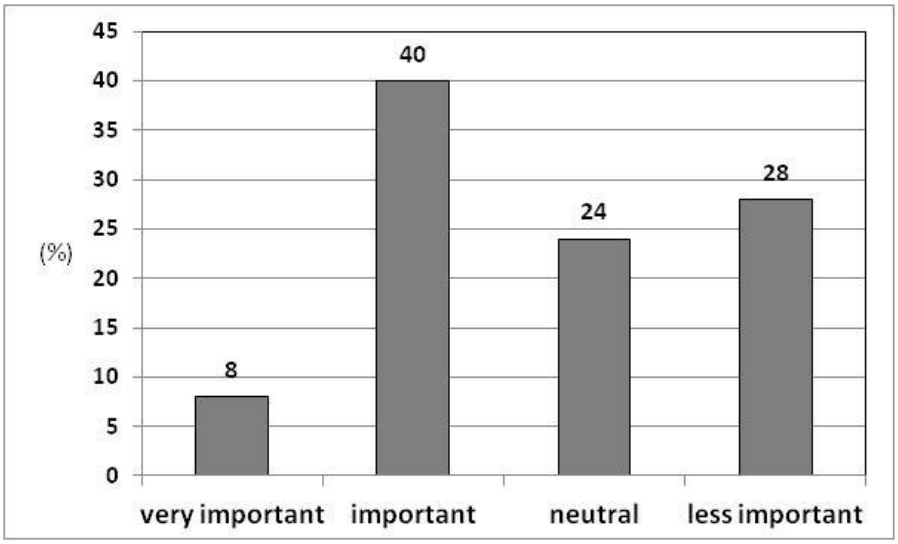

Fig. 3. Importance of P.E. among students living in orphanage (n = 50)

When evaluating the opinions regarding the importance of P.E. between boys and girls, no significant differences ($p > 0.05$) were proven. A percentage evaluation of responses, however, points to a greater degree of importance expressed by boys, of which 63.6 % considered P.E. to be an important or even very important subject, as opposed to 35.7 % of girls. They took a neutral (21.4 %) or even negative view (42.9 %) at a higher percentage (Figure 4).

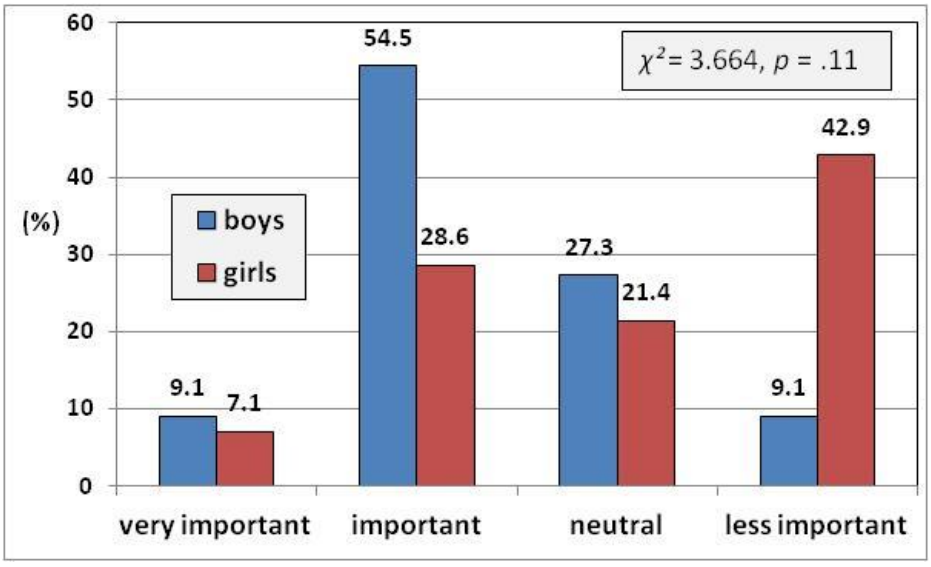

Fig. 4. Differences in importance of P.E. between boys (n = 22) and girls (n = 28)

Feelings of students living in orphanage during P.E. classes

Students living in orphanage expressed having high evaluation of their feelings during P.E. classes when 48 % of them feel during the P.E. always good and 20 % mostly good. On the other hand 32 % of students from orphanage took a neutral view (Figure 5). High level amount of feeling during P.E. classes is showing the achieved average level of the responses (1.84 of the point score).

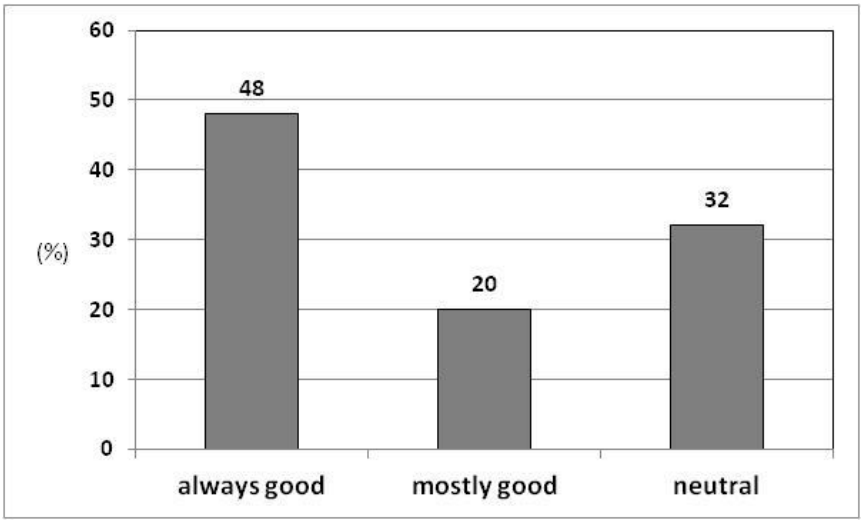

Fig. 5. Feelings during P.E. classes of students living in orphanage (n = 50)

Even though girls have a good feeling (mostly good and always good) about themselves while in P.E. classes (64.3 %), boys expressed having a bit higher evaluation of their good feelings (72.8 %). A comparison of the opinion towards P.E. between boys and girls proved to be not statistically significant (p >0.05) (Figure 6).

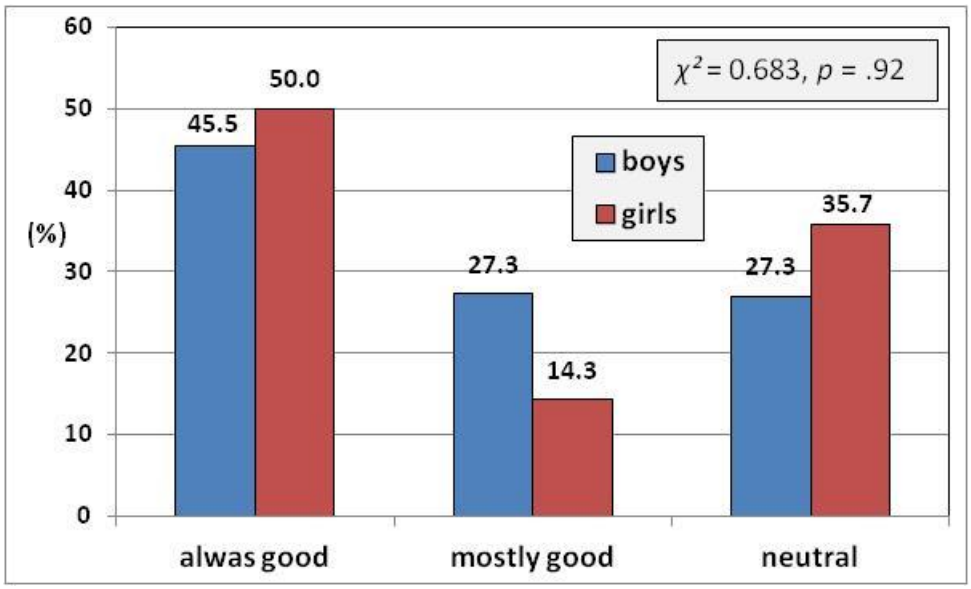

Fig. 6. Differences in feelings during P.E. classes between boys (n = 22) and girls (n = 28)

The above-mentioned statement is closely related to the attitudes of orphan students regarding their displays of effort during the classes (Figure 7).

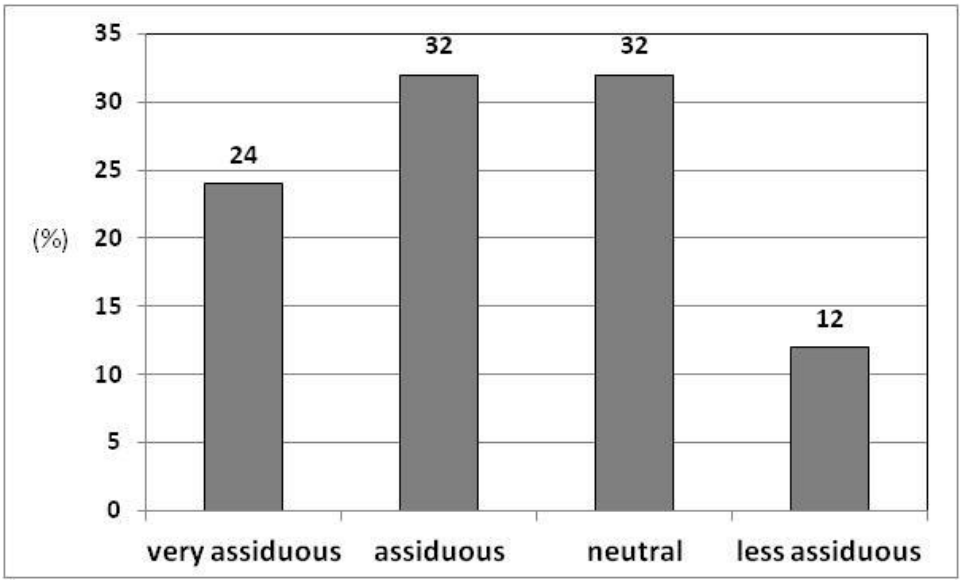

Fig. 7. Displays of efforts during P.E. classes by students living in orphanage (n = 50)

Students living in orphanage are mostly just assiduous (32 %) or had a neutral attitude (32 %). This is clearly shown by the percentage evaluation of the indicator of effort invested in exercises. The amount of effort shown during P.E. classes is probably dependent on what they are doing at the moment, thus sometimes they make effort and sometimes they do not. Lower level amount of effort expended when participating in P.E. class can also be inferred from the achieved average level of the responses (2.32 of the point score).

The very assiduous and assiduous group mostly consists of girls (57.1 %), not boys, who are mostly les assiduous or had a neutral attitude (45.5 %). These results showed no statistically significant difference ($p > 0.05$) in displays of efforts during P.E. from the point of view of the respondents' gender (Figure 8).

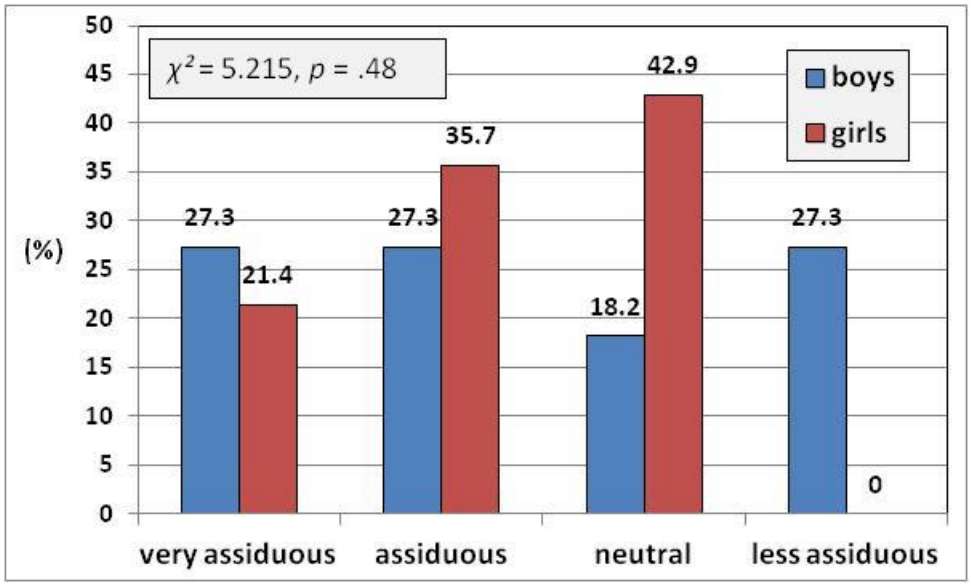

Fig. 8. Differences in effort displays during P.E. classes between boys (n = 22) and girls (n = 28)

Preference for various physical activities among students living in orphanage

Students living in orphanage were most interested in soccer (48.0 %). The second most preferred physical activity at the P.E. classes is dancing (36 %) and other very popular activities in

P.E. classes for students who are living in orphanage covered volleyball, tennis, swimming and basketball (Figure 9).

When comparing the differences in the preference of various physical activities and exercises in P.E. classes, boys were most interested in soccer (81.8 %), whereas girls opted for the dancing (Figure 10). Other very popular activities in P.E. classes for girls covered various sports (volleyball, tennis and adapted physical activities) which were, however, less popular among boys. These results showed no statistically significant differences in the preferences for various physical activities between boys and girls – orphan students.

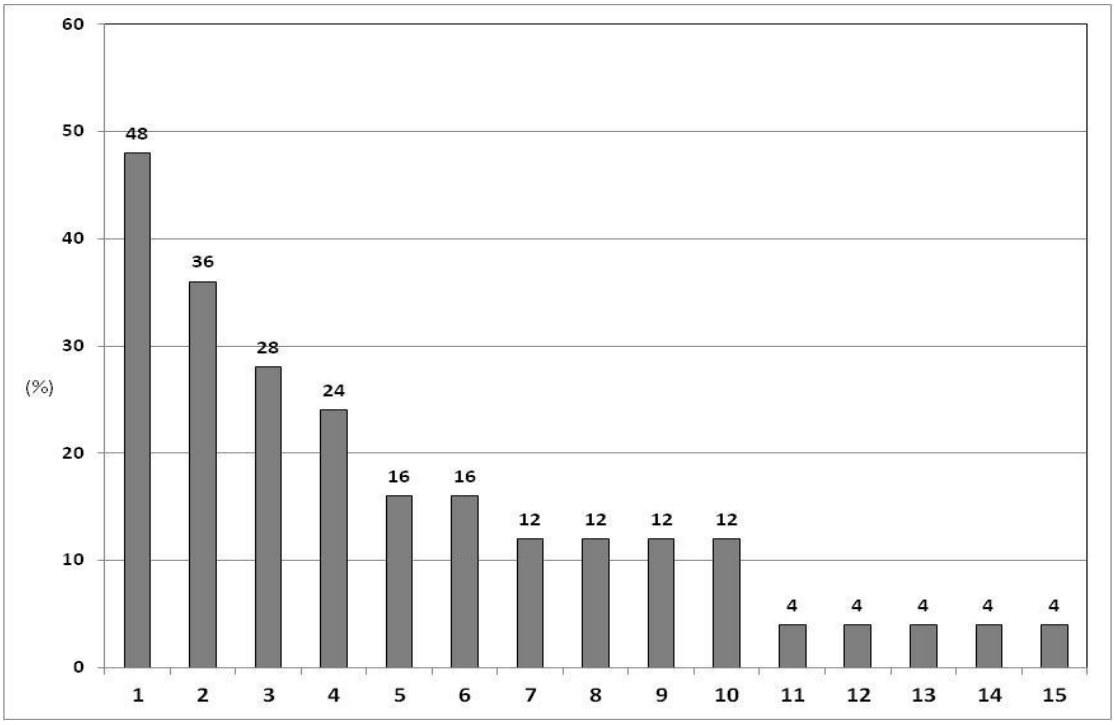

Fig. 9. Preferences for various physical activities among students living on orphanage (n = 50)
Legend: 1. soccer; 2. dancing; 3. volleyball; 4. tennis; 5. swimming; 6. basketball; 7. badminton; 8. floorball; 9. zumba; 10. adapted physical activities; 11. athletics; 12. aerobics; 13. frisbee ultimate; 14. wrestling; 15. dodge ball

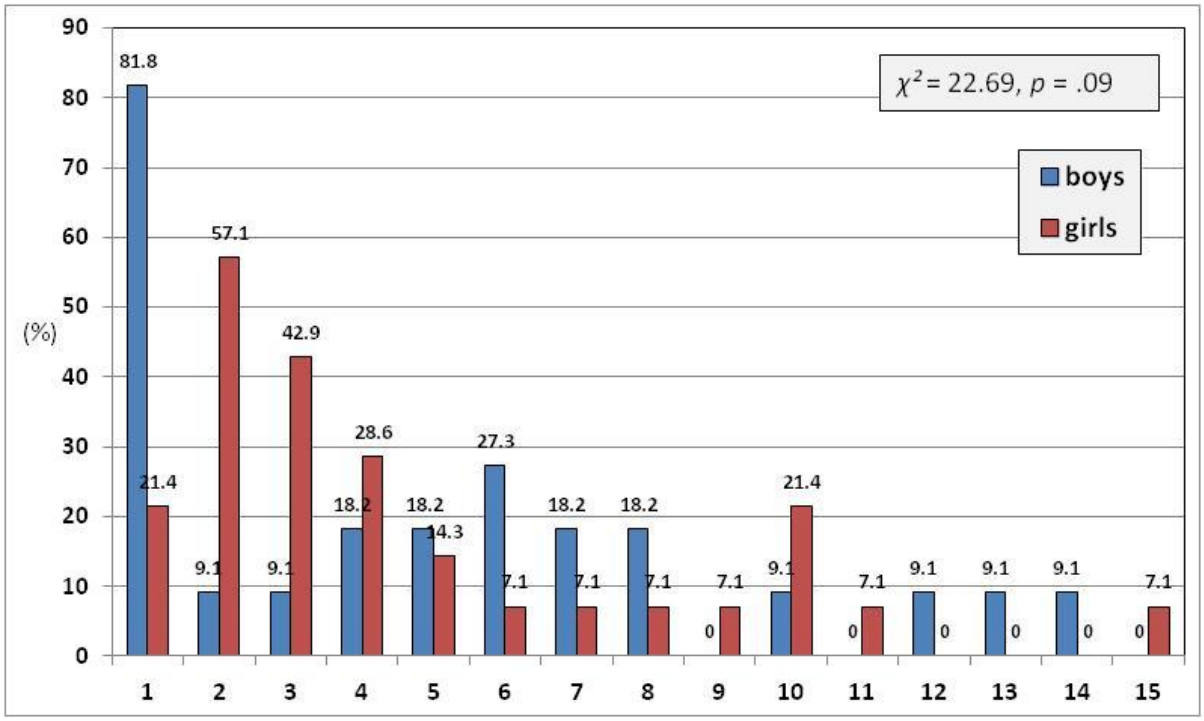

Fig. 10. Preferences for various physical activities between boys and girls
Legend: 1. soccer; 2. dancing; 3. volleyball; 4. tennis; 5. swimming; 6. basketball; 7. badminton; 8. floorball; 9. zumba; 10. adapted physical activities; 11. athletics; 12. aerobics; 13. frisbee ultimate; 14. wrestling; 15. dodge ball

4. Discussion

The aim of this study was to describe and analyse the perceptions of the attitudes of P.E. among children who are living in orphanage.

The level of popularity of P.E. was stated by orphan students reaching 2.00 of the point score. By comparing the average values of the responses provided by pupils with disabilities (receiving special education) with pupils without disabilities from regular Slovak elementary schools from study of Antala (2012), the highest level of popularity of P.E. was stated by pupils with visual disability (VD) (1.64 of the point score) as opposed to pupils without disabilities (1.92 of the point score). The lowest level of popularity was expressed in the same research by pupils who are deaf or hard of hearing (D/HH) whose average value of responses reached 2.08 of the point scores what is close to the score of orphan students. When comparing the average values of responses by pupils from the second stage of the regular elementary schools in the Czech Republic for the given indicator (Hrabal, Pavelková, 2010), a popularity concordance was discovered with responses by the Slovak pupils with VD (1.65 vs 1.64 of the point score). There was another interesting scientific finding that students of the secondary school with physical disability (PD) expressed very high level of P.E. popularity (2.13 of the point score) (Nemček, Bergendiová, 2013).

The level of importance of P.E. was stated by orphan students achieving 2.72 of the point score. By comparing the evaluation of the importance of P.E. by pupils from other schools in previous study (Kurková et al., 2015), researchers found out that pupils with VD consider P.E. to be their most important subject (1.73 of the point score). Pupils who are D/HH in the same research considered it second most important (2.05 of the point score) and pupils without disabilities (Antala et al., 2012) considered it the least important of the three groups. The lowest degree of importance of P.E. was awarded by secondary school of students with PD (Nemček, Bergendiová, 2013), with a point score of 2.43. Czech pupils without disabilities (Hrabal, Pavelková, 2010) considered P.E. to be the most important from all evaluated schools, and their point score was 2.80 which are very close to the score of orphan students of our findings.

The level of feeling of P.E. was stated by orphan students by 1.84 of the point score. By comparing the evaluation of the feelings of P.E. by pupils from other schools in previous study

(Kurková et al., 2015), researchers found out that the highest level of good feelings express pupils who are D/HH achieving 2.14 of the point score, then students with PD with 1.90 points and the lowest level of feelings showed pupils with VD (1.52 of the point score). Our orphan students presented similar level of feeling than students with PD from study of Kurková, Nemček & Labudová (2015).

The level of effort of P.E. was stated by orphan students achieving 2.32 of the point score. By comparing the evaluation of the effort of P.E. by pupils from other schools in previous study (Kurková et al., 2015), researchers found out that pupils who are D/HH display the highest efforts during P.E. classes (2.30 of the point score) what is equally with our orphan students. The lowest degree of effort of P.E. was awarded by Czech students without disabilities (Hrabal, Pavelková, 2010), with a point score of 1.92.

The preferences for various physical activities during P.E. classes of orphan students were discovered. Children who are living in orphanage prefer team sport (soccer, volleyball, basketball and floorball) and physical activities performed in collective together with other students like dancing and zumba probably because they want to be integrated and socialized among other students. The investigation of Kurková, Nemček & Labudová (2015) found, that individuals with VD prefer individual physical activities such as athletics, swimming or gymnastics so that they can avoid direct contact with their teammates. An interesting yet quite understandable fact in the research of Kurková, Scheetz & Stelzer, (2010) was the finding that activities with music accompaniment (zumba, gymnastics and dance) are not popular in pupils who are D/HH since their ability to use rhythm as an assistive aid may not be possible. Thus, physical activities of this kind are not attractive for pupils who are D/HH. A study conducted by Kurková & Maertin (2014), however, proved that even physical activities that place high demands on rhythm perception with musical accompaniment or cues may become a life-long hobby for individuals who are D/HH regardless of their age.

We found that boys and girls living in orphanage demonstrate attitudes towards P.E. lessons as well as prefer physical activities in a very similar way.

Limits of study

The results cannot be generalized, they only attest to the orphanage within the given region. This study was limited due to the low number of orphan students, as well as due to the lack of knowledge of the level of current fitness and overall health condition of the students under this study.

5. Conclusion

The degree of popularity of P.E. is often related to the level of a student's successful gaining of movement skills, the level of intensity of specific exercises and their degree of difficulty, all which affect the student's ability to display their personality. When accepting the specific requirements of physical activities, we recommend that teachers create a space integrating orphan students among their peers to be fully socialised. This will increase the popularity of this mandatory subject and allow physical activities to become a regular part of students' leisure activities.

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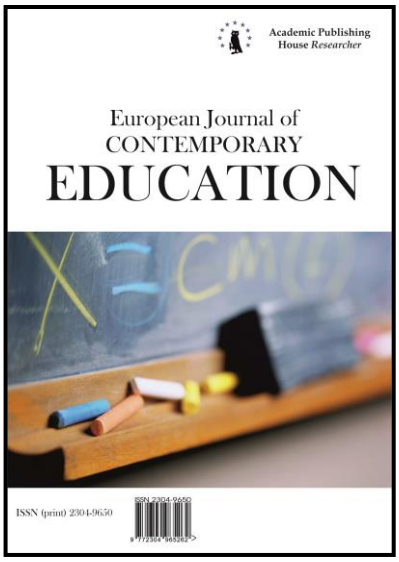

Written Discourse as a Product of a Completed Level of Professionally-Oriented Foreign Language Speech Competence of University Students

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Abstract

Contemporary foreign-language education focuses on the development of multicultural language personality of the university graduate, who has necessary competencies to implement in professional activities. One of such competences is professionally-oriented foreign language communicative competence that is responsible for the capability of a future specialist to take active part in professionally-oriented intercultural oral and written communication.

The article is aimed to determine the purpose of speech competence as a component of professionally-oriented foreign language communicative competence in the implementation of written foreign-language communication through written discourse, and to identify the characteristics of the latter for teaching to make up diverse types of written discourse included in the curriculum of a non-linguistic university. Leading approaches to study this problem are competence-focused, professionally-oriented, person-centered and communicative and cognitive approaches, considering professionally-oriented foreign language speech competence a complex system with written speech activity as one of its components, that serves communication through various types of written discourse. The article presents the composition of professionally-oriented foreign language speech competence and describes typological features of written discourse as a product of a completed level of this competence. The article describes manifestation of these features in the abstract at the strategic, tactical, genre-related and linguo-rhetorical levels, and the results of experimental work on teaching to make up abstract as a type of discourse that identifies its contribution to the formation of professionally-oriented foreign language speech competence.

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The materials of the article are of practical value for those who study professionally-oriented foreign language speech competence and written discourse as a product of a completed level of this competence, as well as for those who teach students to make up diverse types of foreign language written discourse.

Keywords: communication; professionally-oriented foreign language speech competence; written discourse; abstract; non-linguistic university.

1. Introduction

According to the requirements of the Federal State Higher Educational standards (Federal State ...), foreign language communicative competence is the specific purpose of teaching foreign languages in a non-linguistic university. A completed level of this competence provides the graduate with necessary capabilities to work fully with foreign language information sources, to get best access to world achievements, to contact with foreign partners in the field of professional activity.

In this regard, teaching a foreign language in a university acquires a context-focused, i.e. professionally-oriented character (Bezukladnikov et al., 2014), which is based, according to P.I. Obraztsov, on taking into account the needs of students in learning a foreign language, oriented to special features of the future profession. It involves the combination of mastering a professionally-oriented foreign language and the development of students' personal qualities, knowledge of culture of the foreign language speaking country and the acquisition of special skills and competences based on professional and linguistic knowledge (Obraztsov, Ivanova, 2005).

It is obvious that in the course of such training the foreign language communicative competence acquires a professionally-oriented character (Kolesnikov, 2015). Firstly, it allows us identify professionally-oriented foreign language communicative competence (POFLCC) as an integrative personal characteristic of a specialist reflecting his/her readiness and capability to take part in professionally-oriented intercultural and interpersonal foreign language communication based on a combination of subject and linguistic knowledge, skills and competences, as well as the experience of future professional activity that help the graduates to solve professionally important tasks. Secondly, this fact makes it possible to assert that the components of POFLCC also acquire professionally-oriented character.

The speech competence, as an object of this research, is one of the component parts of POFLCC. It is responsible for the ability of students to perform listening, speaking, reading and writing as types of speech activity serving foreign-language communication in the professional sphere. Therefore in order to acquire professionally-oriented foreign language speech competence (POFLSC), in the process of foreign language learning students must be involved into all types of speech activity in situations that imitate real professional communication. At the same time, working practice at the university shows that foreign language written speech activity is not in focus today. Hence appears students' inability to make up diverse types of written discourse (WD) with the help of which they could participate in professional interaction with colleagues foreign language speakers. In this regard, the aim of this study is to present POFLSC and to prove that students' ability to make up diverse types of WD that helps students take active part in professionally-oriented foreign language communication, can be identified as the outcome of its forming.

2. Materials and Methods

In the process of research of POFLSC and WD as a product of its completed level in non-linguistic university the following methods were used: systematization and generalization of concepts and facts, working on model and project, standards analysis, experiment. The aim of the research was to determine the efficiency of POFLSC in the implementation of professionally-oriented written foreign language communication by means of various types of WD and to identify specific features of the latter. It will help the graduates meet the requirements set in Federal national higher educational standards.

To achieve the aim we have used basic theoretical issues of competence-focused, professionally-oriented, person-centered and communicative and cognitive approaches on the basis of the Kirov State Medical University. The research was carried out step by step to meet the challenges proving the following points: a) to consider communication as the target of the process

of POFLCC forming, and to demonstrate the implementation role of diverse types of speech activity; b) to analyze POFLSC and present it as a model, to specify the content of its components corresponding to the non-linguistic university environment; c) to undertake a comparative analysis of the text and discourse to prove that WD with its professionally-oriented foreign language features will act as a completed outcome of POFLSC; d) to identify typological features of WD and show how they function in abstract which is one of targets in learning a foreign language in non-linguistic university; e) to carry out experimental work with first-year students (a total of 25 subjects) to prove by means of G-criterion sign test that WD acts as a completed outcome of POFLSC.

3. Results

The ambiguity of the concept of "communication" makes us find its interpretation at the philosophical level (M.S. Kagan), and applying its content in regard to professionally-oriented written foreign language communication. Thus the latter is considered as a process of "subject – subject interaction" (Kagan, 1988), and presents its first component - interacting subjects, having specific characteristics and being representatives of different cultures with their traditions and values.

One of the subjects performs the function of a writer and aims at initiating, constructing and supervising the process of making up a written composition for the complete and accurate recording of professionally important information, as well as the ideas associated with it, and its transmission to the second subject (recipient) in order to influence him/her and get the desired outcome (Cheremisinova, 2015).

Social and cultural environment where interactions of the subjects take place acts as the second component of communication and reflects the sphere of professional activity of non-linguistic university graduates. In a separate act of communication the environment is represented by a social and cultural situation in the combination of speech-related and non-speech-related conditions organizing subject-subject interaction in the process of professionally-oriented written foreign-language communication.

The teaching means necessary for functioning of communication can be identified as its third component. In this research these means are represented in written types of speech activity (reading and writing), the students' capability to make up these types of speech activity that is provided by a complete level of POFLSC. Analysis of Russian and foreign methodological literature (I.R. Maksimova, R.P. Milrud (2000), V.V. Safonova (1996), A.V. Khutorskoy (2005), A.N. Shchukin (2006); L. Bachman (1987), H. Boyer (1990), J.A. van Ek (1986), M. Canale, M. Swain (1980), etc.) has shown the ambiguity of interpretation of this concept and motivated us to turn to the concept of "educational competence", suggested by A.V. Khutorskoy, who defined it with the reference to professionally-oriented teaching. In his opinion, this competence comprises a set of interrelated personal characteristics (knowledge, skills, competences, methods of activity) assigned to a certain range of subjects and processes, and it manifests itself in the readiness and capability to undertake high-quality productive activities in this sphere (Khutorskoy, 2005). It makes possible to introduce the POFLSC of non-linguistic university students as readiness and capability to undertake all types of speech activity as means of professionally-oriented foreign language communication, based on knowledge of the ways of receiving, comprehending, interpreting and transmitting foreign language information, as well as the ability to use them for participation in written/oral communication, important and valuable for their future professional activity (Dmitrievykh, Kuklina, 2016).

Composition of POFLSC is a set of social, subject and procedural components. The social component is determined by the future professional activity of students and reflects social and cultural environment in which this competence should function. It includes spheres, themes and social and cultural situations of foreign language communication, typical for professional activities of future specialist.

The subject component assumes both professional knowledge, reflecting special professional features, as well as subject knowledge about the methods of receiving, comprehending, interpreting and transmitting information. The first group of knowledge can be obtained from professional texts in the framework of spheres, themes and social and cultural situations of professionally-oriented foreign language communication represented in the social component of the competence.

Information on methods to implement speech activity is found in specially prepared instruction notes accompanying these texts.

And, finally, the procedural component appears in the form of a set of speech skills that provide students with the ability to implement all types of speech activity in social and cultural situations of foreign language communication, determined by their future professional activity (Dmitrievykh, Kuklina, 2016). According to A.N. Shchukin teaching of written communication in the professional sphere prevails in non-linguistic universities (Shchukin, 2006), so the procedural component of POFLSC can be presented in the form of skills: a) to read, comprehend and interpret foreign texts using various kinds of reading with a partial reference to the dictionary; and b) to make up abstract to foreign language text.

The research focuses on written speech skills as means of professionally-oriented written foreign-language communication, the effectiveness of which depends on current social and cultural situation and the communicative task, writer's and recipient's individual characteristics and their experience in a foreign language. They determine both the process of functioning of written communication, and WD as its product.

The latter is presented as a written work organized in accordance with the social and cultural situation and communicative task, reflecting the writer's individual characteristics and his/her speaking experience in a foreign language and intended for the imaginary recipient (Kuklina, Cheremisinova, 2016). WD comes to an imaginary subject in the form of text presented either on paper or electronically. In this regard, WD, on the one hand, the signs traditionally inherent in the text, such as integrity, complete character, compositional design, stylistic features, cohesion, etc. (I.R. Galperin (2007), N.P. Golovina (2004), G. Kadyyr (2016), E.S. Ustinova (2016), and others).

The characteristics mentioned above can be combined into the following groups of features: 1) genre-related (stylistic feature); 2) text-related (cohesion, integrity, completeness); and 3) linguo-rhetorical (compositional design). At the same time, comparative analysis of the text and discourse showed that WD also contains specific features, determined by the functioning of professionally-oriented foreign language communication. These features influence the outcome of written communication, i.e. the recipient's response or action expressing his/her attitude to the point.

WD produced in the process of functioning of professionally-oriented foreign language communication can act as a completed outcome of POFLSC only if students take into account not only features classically assigned to a text but also specific ones. Let's characterize the latter more detailed, using Russian and foreign researches (N.D. Arutyunova (1990), N.P. Golovina (2004), S.K. Gural (2014), V.K. Bhatia (2004), G. Cook (2004), T.A. van Dijk (1997), I. Karg (2007), S.K. Kaufmann (1997), X. Roth (2016), H. Trescher (2015), J. Wildt (2016) and others).

The first group of features is associated with the planning of communicative behavior, when the writer with his/her individual characteristics, analyses social and cultural situation of professionally-oriented foreign language communication, known characteristics of the recipient, possible relationship in the process of communication, and defines his/her communicative task. In other words, it outlines a strategy for producing WD that allows us, after N.P. Golovina, to call them strategical features.

The second group suggests selecting means of professionally-oriented foreign language communication in writing. They should be adequate to enable the student fulfil the task set within a certain social and cultural situation. They should also take into account the individual's characteristics and his/her communication experience in a foreign language. This group will be determined in this article as a tactical feature realizing the strategy of choice (Golovina, 2004).

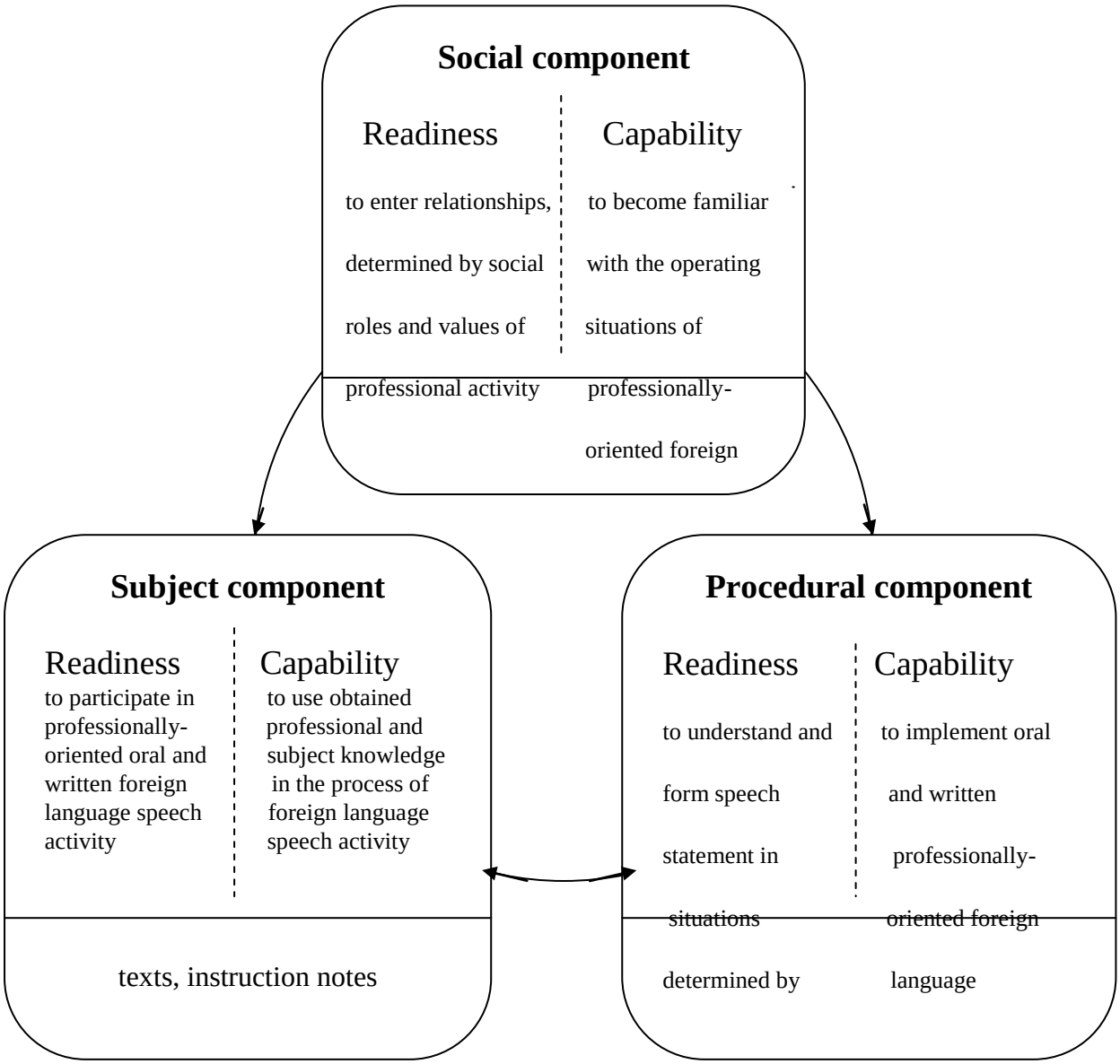

Fig. 1. Model of professionally-oriented foreign language speech competence

Therefore, the written discourse as a product of professionally-oriented foreign language communication can be characterized according to 5 groups of features: 1) strategical which is responsible for planning communicative behavior; 2) tactical which is associated with selecting adequate means of professionally-oriented foreign language communication in writing; 3) genre-related which is responsible for the range of genres in the written speech and the choice of genre-and-style related norms; 4) text-related including cohesion, integrity and complete character of WD; 5) linguo-rhetorical revealing in the composition and a certain linguo-rhitorical structure of WD (Kuklina, Cheremisinova, 2016).

The picture shows that a piece of written discourse doesn't only have features classically assigned to a text but also has some specific ones (strategical and tactical) which are determined by the fact of its production for a specific function - professionally-oriented foreign language communication. This fact enables WD to act as a completed outcome of POFLSC. Hence when a text presented either on paper or electronically is addressed to a recipient it has to contain all the range of the typological features mentioned above. Whereas the latter are sure to reveal their peculiarities only on the strategical, tactical, genre-related and linguo-rhetorical levels. The reason is text-related features can be assigned to any type of WD.

Let's characterize how the typological features function in abstract which is one of targets in learning a foreign language in non-linguistic unuversity. Abstract suggests concise, highly

compressed logical rendering of the original text (source) to focus the recipient's attention by offering him/her brief information, its subject, value, purpose. Abstract gives an insight of what the original text is about providing the readers with the main ideas without uncovering them (Ariyan, Shamov, 2017).

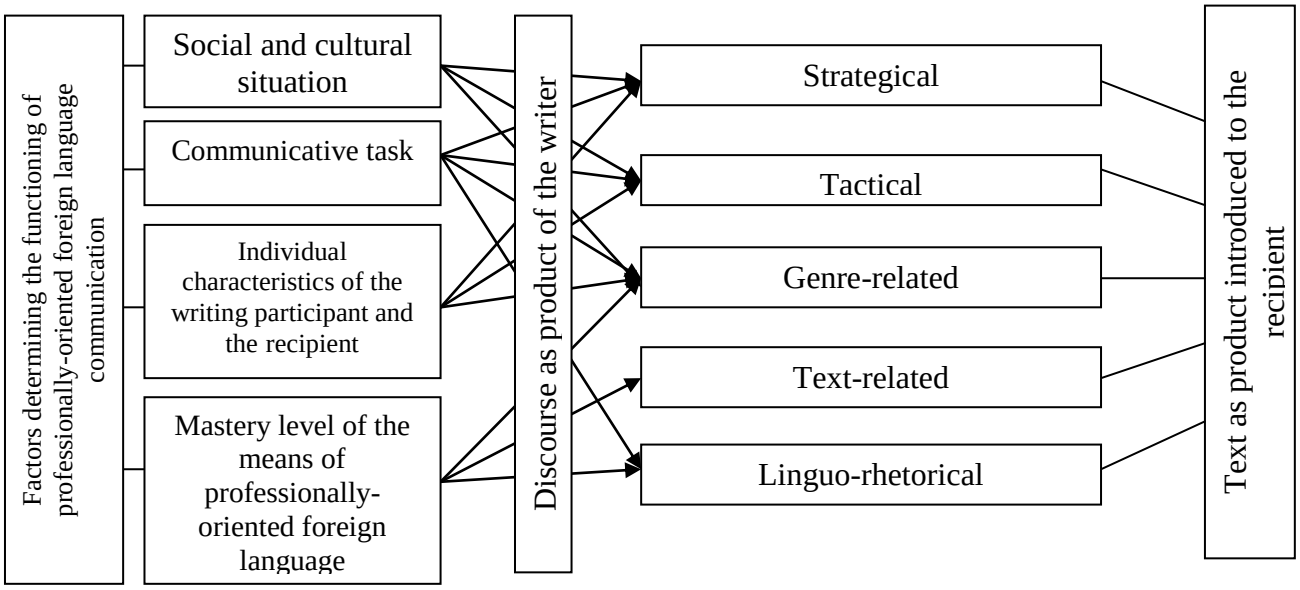

Fig. 2. Typological features of written discourse as a product of professionally-oriented foreign language communication

Characterising this type of WD according to the typological features we should, first and foremost, limit types of relations between participants of professionally-oriented foreign language communication in a certain social and cultural situation. They result as a sort of response from a combination of non-speech-related conditions (purpose of communication, object in focus, etc.) and speech-related conditions (necessary and relevant language and speech material in the experience of both the writing agent and the recipient). These conditions manage the interaction of WD communicants.

This research focuses on such relations as social status type, role type on the one hand and activity type and moral type on the other hand which are integral to the first two types. Social status type relations are revealed when participants representing diverse occupations interact (a doctor, an economist, an accountant, etc.). Role type relations arise from the roles the participants play within formal/informal professionally-oriented foreign language communication. In any case the participants act motivated by certain moral issues, such as humanism, tolerance, tact, responsibility, etc. (Passov, Kuzovleva, 2010).

Secondly, we take into account that both the writing agent and a recipient have a mastery of macro-operations necessary for the language in question. Moreover, the level of the mastery should be adequate enough to make up WD of a certain type.

This description of abstract as a type of WD has been implemented in the experimental work with first-year students at Kirov State Medical University. The objective was to teach students write abstracts in a foreign language valid for the country of its origin. For this purpose several complexes of exercises have been made up. They comprised introductory analytical exercises, conceptually speech exercises and speech exercises aiming at forming the skills in question concerning abstract as a type of WD. They are accompanied by notes explaining peculiarities of each type of discourse, the instruments how to structure each type, the vocabulary and grammar contents, the assessment criteria. The quality of written works after the implementation of these complexes enabled us to detect their contribution in forming professionally-oriented foreign language speech communication and evaluate its level in non-linguistic students according to the given below criteria and parameters.

Table 1. Description of abstract as a type of written discourse

Feature	Description
Strategical and tactical	A social and cultural situation includes relations between the participants of formal communication representing diverse profession groups. Communicative task: to inform, to report. Individual descriptions of the participants meaningful for communication: social experience, social speech status, social roles, etc.
Genre-related	Written discourse is characterized by highly informative nature, generalisations, compression (500-1500 characters); abstracted topics, absence of subjective judgements, precision, logics, choice of the vocabulary pre-determined by the original text; uses simple language available to a wide range of specialists; standard terms, set-expressions, book terms (impersonal sentences, passive structures, a big quantity of compound nouns).
Linguo-rhetorical	Written discourse has the following structure: а) information on the resourses; б) subject-related column; в) theme; г) the body of the abstract; д) the author's conclusion(s).

Table 2. Criteria and parameters to evaluate the completed level of professionally-oriented foreign language communication

Feature	Level	
	high	Point
Strategical	Communicative tasks have been realized completely, all parameters of a communicative situation have been determined, description of an individual recipient and his foreign language communication experience have been specified ;	5
Tactical	All parameters of a social and cultural situation have been taken into account, учтены все параметры социокультурной ситуации, description of an individual recipient and his foreign language communication experience, life style, maxims, basic values, behavior standards, traditions characteristic of the comminicants' culture have been specified; completely adequate text	5
Genre-related		5
Choice of genre	The genre is fully in accord with the communicative task, social and cultural situation;	5
Genre and style norm	Genre and style norms are completely observed;	5
Text-related		5
paragraphing	The rhetorical structure within a paragraph is complete;	5
Cohesion	Diverse and relevant means of cohesion, 100% cohesion;	5
Integrity	The theme is revealed completely, the given information is relevant, the rendering is subsequent and logical;	5

Language-related	Adequate use of vocabulary and grammar, several gross mistakes;	5
Linguo-rhetorical	Linguo-rhetorical structure is completely observed;	5
Total		45

Within the experimental work the results of before-experiment and after-experiment tests have been compared and showed positive dynamics in forming professionally-oriented foreign language speech communication. The analysis detected 6,2% increase in the level of the desired competence as compared with the original figures.

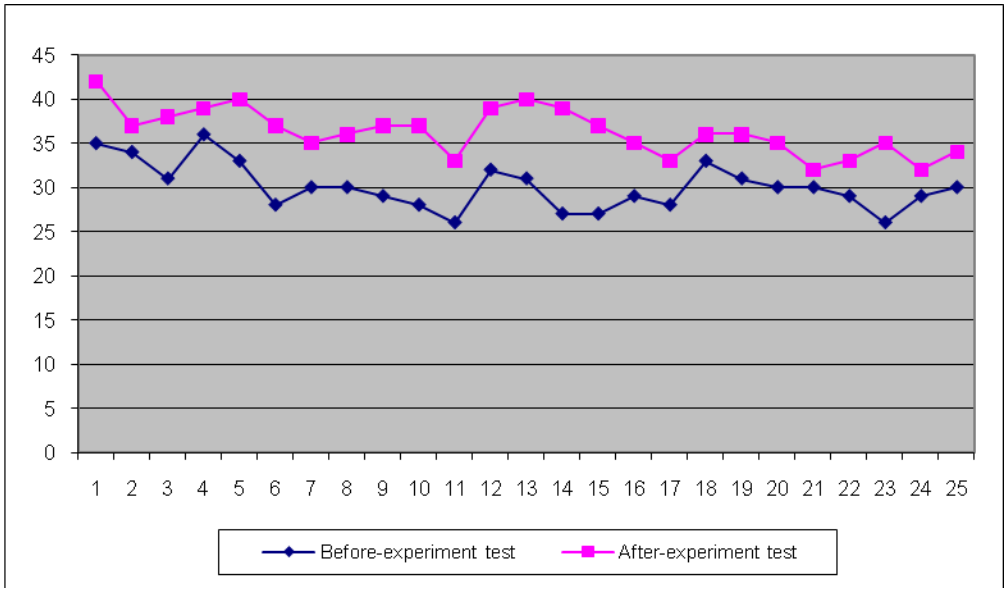

Fig. 3. Comparing the results of before-experiment and after-experiment tests

To prove reliability and validity of the results the data have been processed statistically by means of G-criterion sign test (Ashikhmina et al., 2014) which proved with 95% validity the positive change. The results demonstrate the relevance of the hypothesis: the WD is available at the completed level of professionally-oriented foreign language speech communication in non-linguistic university students.

4. Discussions

In this research we have used:

- concepts on structure and contents of communication in philosophy introduced by M.S. Kagan, who assigns success of communication to, firstly, its participants as unique individuals, secondly, their mastery of the means necessary to achieve the desired results, and, finally, to peculiarity of the social and cultural environment that determines the character, contents and style of communication (Kagan, 1988);

- A.V. Khutorskoy's ideas on competence as a phenomenon and options to build up educational competences on the basis of a range of objects from real life to which they refer, social and pragmatic factor and personal attitude to the competence (Khutorskoy, 2005);

- P.I. Obraztsov's theoretical issues on the specific role of professionally-oriented foreign language learning at university with focus on the learner acquiring professional knowledge, skills and competencies as well as personal characteristics which he needs as a perspective specialist (Obraztsov, 2005);

- basic theoretical issues on text linguistics in I.R. Galperin's works (2007), discourse theory investigated by a group of researchers (N.D. Arutyunova (1990), N.P. Golovina (2004), S.K. Gural (2014), G. Kadyyr (2016), V.K. Bhatia (2004), G. Cook (2004), T.A. van Dijk (1997), I. Karg (2007)). Of great importance is the fact that discourse has features characteristic of the text as well

as some specific features determined by fact it's made to function in foreign language communication;

- R.A. Cheremisinova's works on methods to teach students how to write discourse regarding typological features and their manifestations in diverse types of discourse; they have been proved efficient in the experimental work with university students (Cheremisinova, 2015; 2016).

However, the present-day works on forming professionally-oriented foreign language speech communication in university students are scarce and mainly disputable.

5. Conclusions

The contents of the article prove the need of specific efforts to form professionally-oriented foreign language speech communication in non-linguistic university students to enable them take part in professionally-oriented written communication. A stand-point of the latter is the fact that the students are able to make up diverse types of written discourse with all typological features found. It will help the graduates meet the requirements set in Federal national higher educational standards, i.e. to master the necessary level of professionally-oriented foreign language communicative competence.

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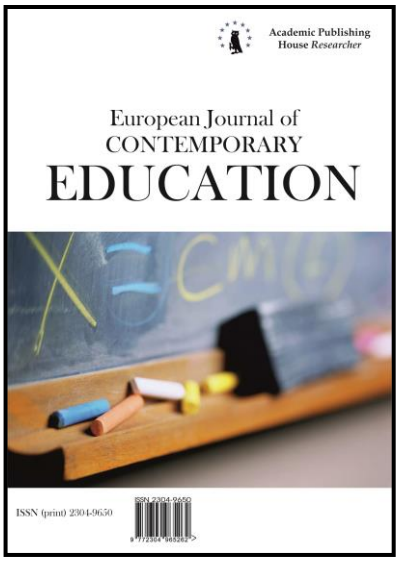

Technology of Synergy Manifestation in the Research of Solution's Stability of Differential Equations System

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Abstract

Effectiveness of mathematical education as non-linear, composite and open system, formation and development of cognitive abilities of the trainee are wholly defined in the solution of complex tasks by means of modern achievements in science to high school practice adaptation. The possibility of complex tasks solution arises at identification of "problem zones" of mathematical education and creation of the generalized constructs of a substance of basic educational elements. As an example of a research of "problem zone" in high school mathematics the problem of visualization and a research of a phase portrait of decisions in the qualitative theory of differential equations for one or several variables functions in the continuous time is considered All stages of developed technology of synergetic effects manifestation are explicated on the example of composite educational construct development – solution stability of differential equations system. As the didactic mechanism of generalized construct substance development the authors suggest a base of professional and applied tasks and modern information and communication technologies of different level: distant environments, mathematical packages, cross-platform environments. Through mathematical and computer modeling it is possible to build the stages of adaptation and technological constructs of updating and manifestation of synergy in mathematics training on the basis of cultures dialogue. The offered technology allows to enhance educational and professional motivations of students, development quality of mathematical knowledge, contributes to efficient development of intellectual thinking operations with the possibility of self-development and manifestation of creative independence of the person.

Keywords: synergy of mathematical education, teaching mathematics, bifurcation analysis, stability of solutions.

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1. Introduction

According to conclusions of the researchers who are engaged in studying of nonlinear systems with chaotic dynamics the complexity is the integrating characteristic of system ability to the self-organization at achievement of its certain critical levels of development (N. Winer, E.N. Knyazeva, S. P. Kurdyumov, G.G. Malinetsky, G. Haken, V. E. Hitsenko, etc.) (Knyazeva, Kurdyumov, 1994; Malinetsky, 2013; Hitsenko, 2014; Haken, 2014). The research of cognitive abilities and cognitive activity of students is interfaced to learning of regularities on complex problem solutions in the process of scientific knowledge evolution (Stepin, 2008). Opening universal patterns of system self-organization of the nature and teaching process to which it is necessary to refer mathematical education, it is possible to establish the heuristic value of complex mathematical tasks in training mathematics for effective personal development as an entry into structure of the attractor in the updating context of cognitive activity. The content of mathematical education in higher education abounds in difficult, multistage abstractions of basic educational elements and procedures that create in most cases a basis for their formal development without the due organization and ensuring efficiency of cognitive processes. We see the solution of this problem in the technological maintenance of cognitive activity of students focused on manifestation of a synergy in the course of identification and updating of generalized designs of modern scientific knowledge (complex problems) with their subsequent adaptation to the content of mathematical education of future expert. It will create the conditions for bifurcation transitions to higher steps of intellectual operations of development and thinking which is trained (A.G. Asmolov, V. V. Davydov, P. Ya. Galperin, E.I. Smirnov, N. F. Talyzina, V.D. Shadrikov, etc.). Such cognitive activity of students is directly connected with research of modern achievements in science and their adaptation to a cash condition of mathematical experience on the basis of information and communication technologies and integration of knowledge from different areas. It creates the conditions for increasing of educational and professional motivation of students, mathematical knowledge and actions development qualities, effective development of intellectual operations of thinking with possibility of self-development and creative independence manifestation of the personality.

2. Methodology and technology

The synergetics which is originally created on a mathematical and natural-science basis and investigating patterns of self-organization and self-development, nature of difficult mathematical knowledge evolution includes in the consideration also questions of knowledge, education, scientific creativity, interaction with the social and cultural environment. The essence of synergetrics as integrated science consists in studying of the processes of spontaneous ordering (transition from chaos to an order) in the open systems of various nature exchanging with environment energy, information and emergence of new properties (Haken, 2004). Thus, expansion of synergetic methods to various sciences is effective when it is required to consider self-organization and self-development, integrated characteristics and difficult constructs. Application of synergy methodology to the process of education will provide a self-organization, self-development and high-quality change of person's identity through the creation of saturated information and education environment (Smirnov, 2016) in which the processes of generation of knowledge of students, their productive creativity, and awakening of own forces and ways of development are possible. According to G. Haken (Haken, 2014) upon transition from chaos to an order in all phenomena arose similar behavior of elements, which he called cooperative, synergetic effect. Identification of probabilities of manifestation of synergetic effects and mechanisms of self-organization of the personality is possible by means of the developed E.I. Smirnov of innovative technology of synergy manifestation in mathematical education, "the personality representing readiness for stage-by-stage development of mathematical activity uniting the synergetic effects expansion of theoretical (experience acquisition), procedural activity (application and transformation of experience), personal and adaptation (development of personal characteristics, intelligence) technology components of complex problems solution in the context of personal preferences realization with a high level of educational and professional motivation development" (Smirnov, 2017).

Readiness for cognitive activity of mathematical education of students on the basis of synergy manifestation should be considered as integrative unity of personal qualities, fundamental

mathematical preparation and experience of teacher. This symbiosis conducts to threshold effect of self-organization and self-development of students directed on: development of multistage generality sign – symbolical systems of high level abstraction, variety of mathematical knowledge; the successful and creative solution of professional focused tasks with a support on innovations in design and self-organization of educational, training and diagnostic activity during joint comprehension of difficult problems of modern achievements in science (Smirnov, 2017; Smirnov, Burukhin, 2017).

Technological maintenance of cognitive activity of students in training of mathematics with synergetic effects is based on stage-by-stage disclosure of difficult essence of some generalized construct of scientific knowledge to research of "a problem zone" of education by means of mathematical and computer modeling in the conditions of mathematical, information, natural-science and humanitarian cultures dialogue. As a research example of "a problem zone" of high school mathematics we will consider a task *of stability theory of differential equations solutions* in the context of the adaptation to cash experience of mathematical knowledge of students.

In article (Smirnov, 2017) E.I. Smirnov revealed and characterized four stages of synergy manifestation of mathematical education on the basis of mathematical, information, natural-science and humanitarian cultures dialogue: preparatory, substantial and technological, control and correctional and generative – reformative stages. It is presented in Figure 1 the columns of stages coordination of manifestation of the essence of basic educational elements of "problem zone" and the stages of synergy manifestation of mathematical education.

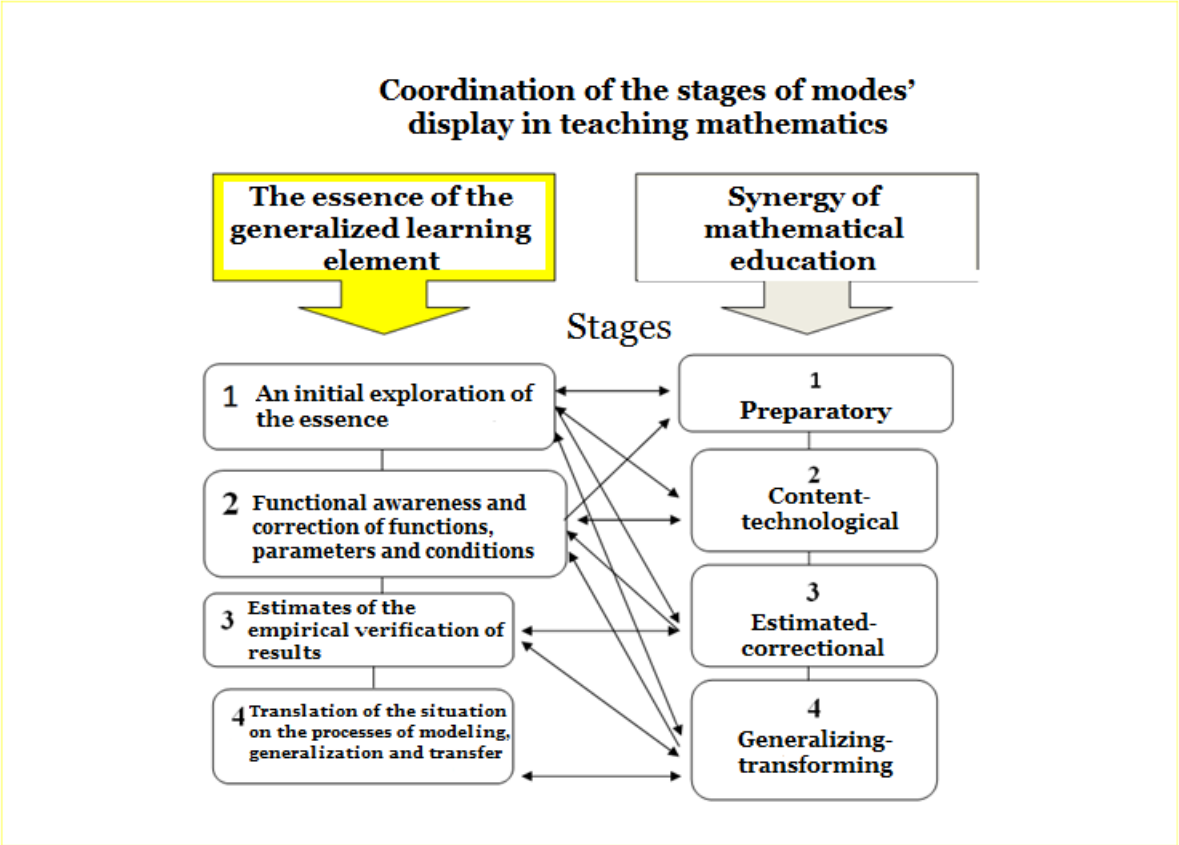

Fig. 1. Stages coordination of basic educational elements of manifestation essence of "problem zone" and mathematical education synergy

Stage I. Preparatory and organizational

Main objectives of this stage: to reveal the problem points and difficulties in successful achievement of cognitive mathematical activity of students; to actualize and create the thesaurus of mathematical education synergy: fluctuations, bifurcation points, strange attractors, etc.; to reveal

the features and preferences at students in thought processes, motivation and a reflection, creativity and communicative activity; to create the steady motives of search and development new in cognitive mathematical activity.

The main result of this stage is the *definition and updating of "problem zone"* of higher mathematics (Smirnov, 2016) by means of search and research of generalized construct of scientific knowledge with the subsequent adaptation to the cash level of mathematical knowledge and methods. For example, *the problem of visualization and research of a phase portrait of decisions in stability theory of differential equations system* for functions of one or several variables by means of computer and mathematical modeling can be considered. The mathematical part of high-quality research of the equations consists in search of topological structures into which the phase portrait of system is decomposed. The applied part consists in comparison of these phase portrait structures to various processes or objects (social and economic, psychology and pedagogical, etc.) together with carrying out the bifurcation analysis (Milovanov, 2005). However the full qualitative analysis of differential equations is not always expedient. Therefore within educational process it is enough to be limited to knowledge of stability (instability area) of system and their interpretation for practice. In this regard, the essence of generalized construct of difficult knowledge consists in *characterization of solutions stability and the analysis of bifurcation transitions in topology of parameters phase portraits of an equilibrium state.* The following definition is lies in the base of stability theory*: Let vector function* f *and all partial derivatives* $\partial f_i / \partial y_k$ *be continuous on t, y. The solution* $\hat{z}(\bullet)$ *of normal system of differential equations* $\partial y(t)/\partial t = f(t, y(t))$, *where* $y(t) = (y_1(t), y_2(t),..., y_n(t))$, $f(t, y) = (f_1(t, y),..., f_n(t, y))$ *is called the stable Lyapunov, if for* $\forall \varepsilon > 0$ *there is such* $\delta > 0$, *that if* $\partial y(t)/\partial t = f(t, y(t))$, $\| y(t_0) - \hat{z}(t_0) \| < \delta$, *so* $\| y(t) - \hat{z}(t) \| < \varepsilon$. *If for* $\delta > 0$ *there is one solution* $y_i(t)$, *i=1,2,...,n, where inequalities are not fulfilled, so the solution* $\hat{z}(\bullet)$ *is called unstable.*

Motivational field: visual, computer and mathematical modeling of professional and applied situations in the treatment of concept "stable solution of differential equations system" (model of Lotka-Volterra competition (the competition of firms, growth of the population, number of warring armies, change of ecological situation, development of science), models of Lancaster, Lotka-Volterra with logistic amendment, Holling-Turner, Kolmogorov, Rosenzweig - MakArthur).

Forms: problem lectures, seminars, work in small groups, scientific seminars.

***Means*:** mathematical and computer modeling with application of MS Excel, mathematical packages (MAPLE, MatLab, MathCad, Octave, SMathStudio, Scilab, GNUOctave, etc.), Web-resources.

Tasks for updating of "problem zone":

1. To investigate by means of mathematical modeling, at what values of parameter α of rest point (a special point of a steady state) of linear differential equations system

$$\begin{cases} \dfrac{dx}{dt} = -3x + \alpha y, \\ \dfrac{dy}{dt} = -\alpha x + y. \end{cases}$$

is stable or unstable?

2. To determine the character of rest point in depending on value of α .

3. Give an example of mathematical model in which there are not damped oscillations. Is it possible to consider this model suitable for the description of the processes connected with thinking, education, etc.? Check the solution of this system for stability.

4. To offer the model of two goods exchange of two producers. At what values of parameters is instability of the solution observed?

5. To offer the model of coordination of supply and demand at stable prices. At what values of parameters is there a bifurcation?

6. To offer creativity model having established possible connection between logical organized thinking and intuitive. Is it possible to take a trajectory of stable focus for creativity process which can be known or unknown? Whether bifurcation transition from a stable limit cycle to steady focus with an unstable limit cycle is possible in this case?

7. Whether it is possible to consider that in model of the competition of two types of populations (for example, dinosaurs and mammals) the death of population of dinosaurs resulted from regularization of their attractor by stable limit cycle.

Example 1. We will pass to the definition of basic designs of mathematical modeling for solution of the problem in tasks 1-2 by small groups of students.

This example represents the system of linear ordinary differential equations of first order. At first we will work out the characteristic equation for this system:

$$\begin{vmatrix} -3-\lambda & \alpha \\ -\alpha & 1-\lambda \end{vmatrix} = 0 .$$

We will transform the left part in last equality by presented it in the form of polynomial which is spread out on degrees λ :

$$(-3-\lambda)\cdot(1-\lambda)+\alpha^2 = 0$$

and present the square trinomial standing in the left part in a standard form:

$$\lambda^2 + 2\lambda + \alpha^2 - 3 = 0 .$$

We will enter designations for coefficients of quadratic equation:

$$a_0 = 1,\ a_1 = 2,\ a_2 = \alpha^2 - 3$$

and will make Gurvits's determinant of these coefficients (Burkin, Melnikov, 2007):

$$\Delta = \begin{vmatrix} 2 & 0 \\ 1 & \alpha^2 - 3 \end{vmatrix} .$$

We will define signs of angular minors of this determinant now. Obviously that $\Delta_1 = 2 > 0$ and $\Delta_2 = 2(\alpha^2 - 3)$. In that case it is necessary to check a necessary and sufficient condition of stability. It will be carried out only under a condition $\Delta_2 = 2(\alpha^2 - 3) > 0$. Applying a method of intervals to this inequality, we will receive: $\alpha \in (-\infty; -\sqrt{3}) \cup (\sqrt{3}; +\infty)$. We will find a discriminant and characteristic numbers of this system of differential equations, i.e. roots of the written-out earlier quadratic equation $\lambda^2 + 2\lambda + \alpha^2 - 3 = 0$. So we have:

$$D = 4 - 4\cdot(\alpha^2 - 3) = 4\cdot(4 - \alpha^2).$$

1) Put first $D>0$, i.e. $4-\alpha^2 > 0$. Obviously in this case $\alpha \in (-2; 2)$. Let us write the characteristic numbers in the form:

$$\lambda_{1,2} = \frac{-2 \pm \sqrt{4\cdot(4-\alpha^2)}}{2} = -1 \pm \sqrt{4-\alpha^2} .$$

Let us consider two parts:

1.1. If $\alpha \in (-\sqrt{3}; \sqrt{3})$, so numbers $\lambda_1 = -1 - \sqrt{4-\alpha^2} < 0$, $\lambda_2 = -1 + \sqrt{4-\alpha^2} > 0$ will be have the different signs. Means, the rest point of system is unstable *(saddle)*. We will check the correctness of solution on the basis of computer modeling using well known software products (the program was created in Adobe Flash using Action Script programming language) (Loginov, 2005).

In Figure 2 the block scheme of algorithmization of computer model where

" *dsolve* " – function of the solution of Cauchy task by some numerical method (Euler, Euler-Cauchy, Runge-Kutt), " *line*" – function of drawing of a piece on the plane.

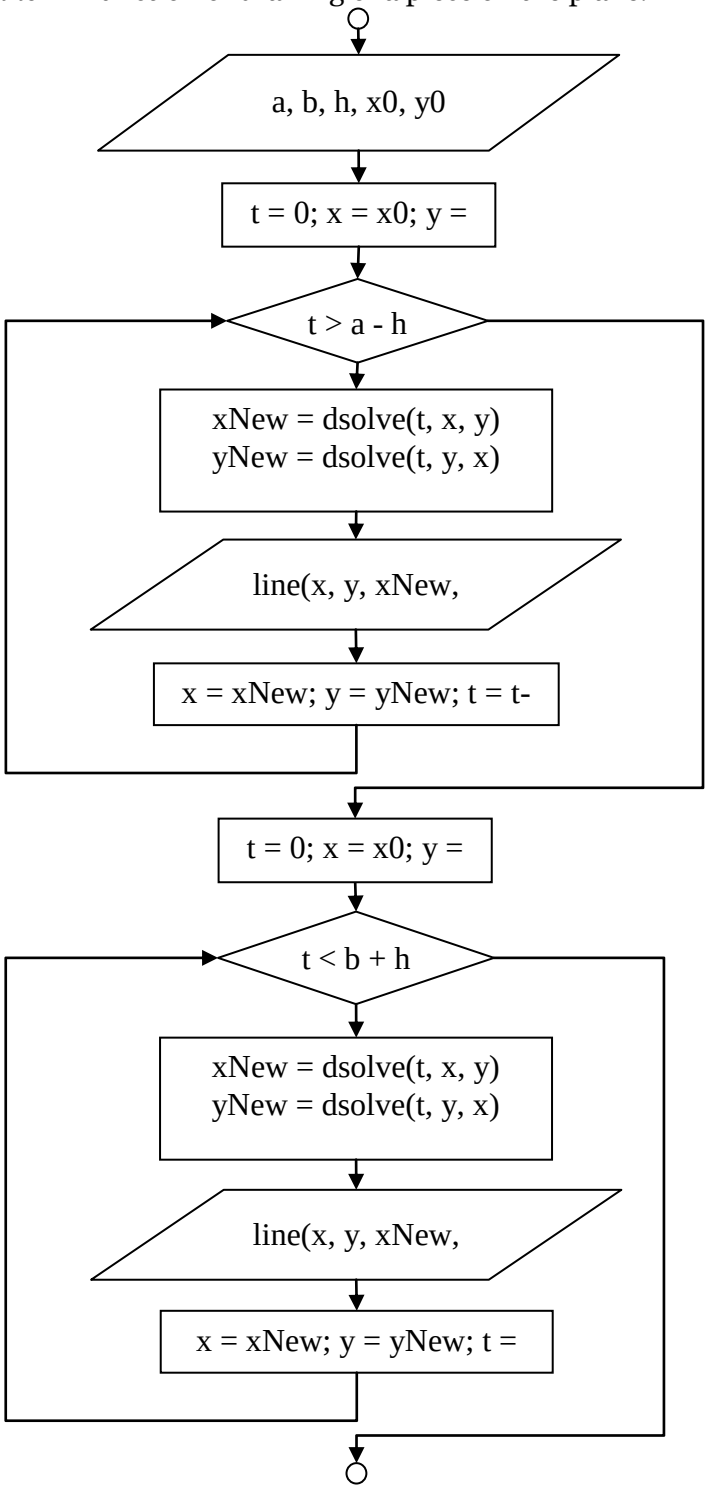

Fig. 2. Block –scheme of computer model algorithmization

Geometrical interpretation

Let us $\alpha = \sqrt{2}$, $\alpha = -\sqrt{2}$, so the systems will have the following forms:

$$\begin{cases} \dfrac{dx}{dt} = -3x + \sqrt{2}y, \\ \dfrac{dy}{dt} = -\sqrt{2}x + y. \end{cases} \qquad \begin{cases} \dfrac{dx}{dt} = -3x - \sqrt{2}y, \\ \dfrac{dy}{dt} = \sqrt{2}x + y. \end{cases}$$

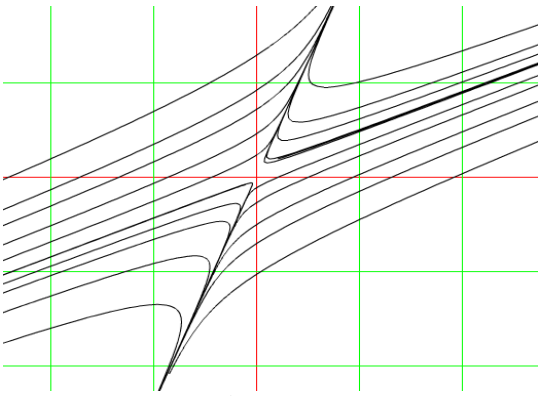

Fig. 3.1a

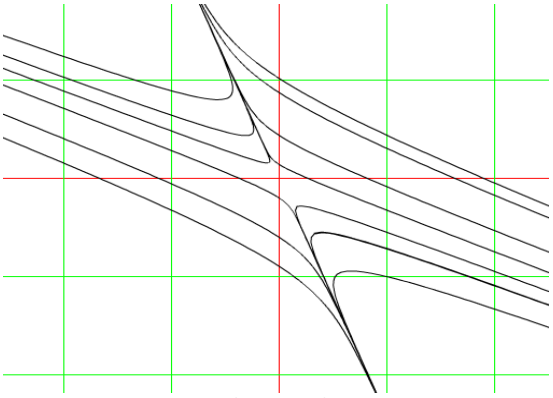

Fig. 3.1b

1.2. If $\alpha \in \left(-2;-\sqrt{3}\right) \cup \left(\sqrt{3};2\right)$, so $\lambda_{1,2} = -1 \pm \sqrt{4-\alpha^2} < 0$. In this case we have the stability of trivial solution of the system. Rest point is *stable node*.

Geometric interpretation

$\alpha = -1{,}8$

$$\begin{cases} \dfrac{dx}{dt} = -3x - 1{,}8 \cdot y, \\ \dfrac{dy}{dt} = 1{,}8 \cdot x + y. \end{cases}$$

$\alpha = 1{,}8$

$$\begin{cases} \dfrac{dx}{dt} = -3x + 1{,}8 \cdot y, \\ \dfrac{dy}{dt} = -1{,}8 \cdot x + y. \end{cases}$$

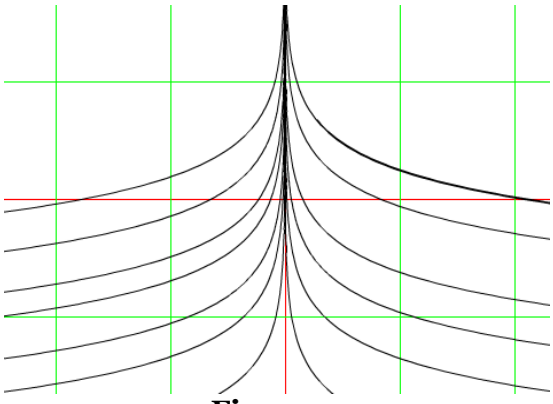

Fig. 3.2a

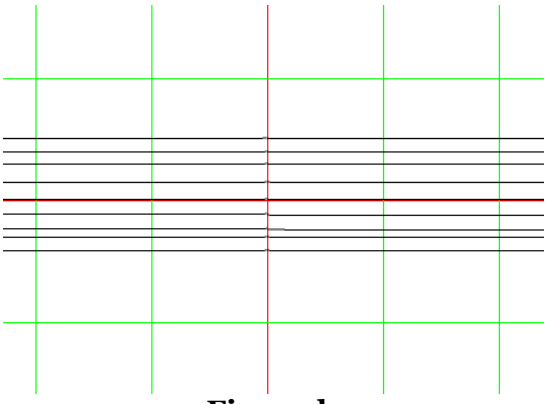

Fig. 3.2b

2) Let us consider *D*=0, i.e. $4-\alpha^2 = 0$. It is clear that $\alpha = \pm 2$. In this case $\lambda_{1,2} = -1 < 0$ and we have a stable solution. Character of rest point is *diacritical stable node.*

Geometrical interpretation

$\alpha = 2$

$$\begin{cases} \dfrac{dx}{dt} = -3x + 2 \cdot y, \\ \dfrac{dy}{dt} = -2 \cdot x + y. \end{cases}$$

$\alpha = -2$

$$\begin{cases} \dfrac{dx}{dt} = -3x - 2 \cdot y, \\ \dfrac{dy}{dt} = 2 \cdot x + y. \end{cases}$$

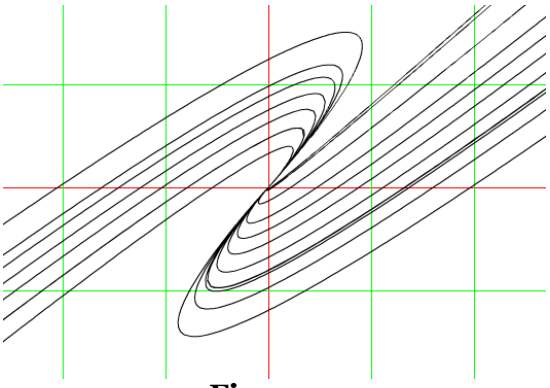

Fig. 3.3a

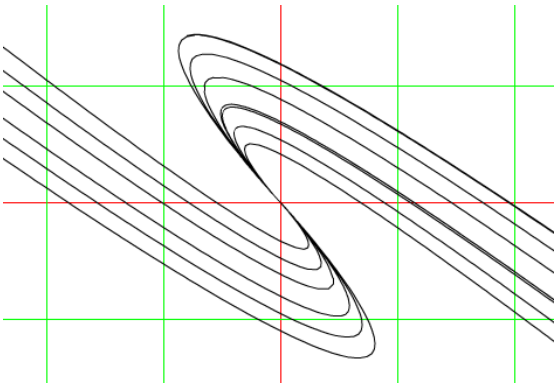

Fig. 3.3b

3) Let us consider the last case $D<0$, i.e. $4-\alpha^2<0$. Then $\alpha\in(-\infty;-2)\cup(2;+\infty)$. Obviously that both characteristic numbers $\lambda_{1,2}=-1\pm\sqrt{4-\alpha^2}$ will be a complex numbers. In this case the trivial solution is asymptotic stable and character of rest point is *stable focus*.

Geometric interpretation

$\alpha=4$

$$\begin{cases}\dfrac{dx}{dt}=-3x+4\cdot y,\\ \dfrac{dy}{dt}=-4\cdot x+y.\end{cases}$$

$\alpha=-4$

$$\begin{cases}\dfrac{dx}{dt}=-3x-4\cdot y,\\ \dfrac{dy}{dt}=4\cdot x+y.\end{cases}$$

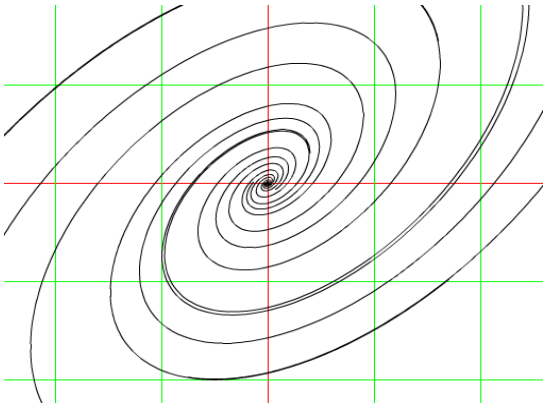

Fig. 3.4a

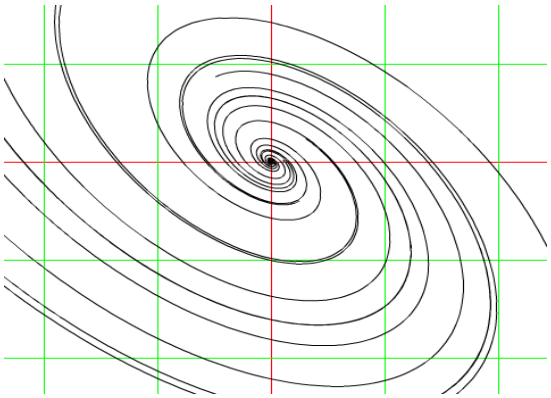

Fig. 3.4b

Remark. This case is of special interest $\alpha=\pm\sqrt{3}$. So we have incomplete square of characteristic equation $\lambda^2+2\lambda=0$. Then roots will be $\lambda_1=0$, $\lambda_2=-2$ and the solution will be stable.

For cases $\alpha=\pm\sqrt{3}$ we will have the following trajectories:

$\alpha=\sqrt{3}$ $\qquad\qquad$ $\alpha=-\sqrt{3}$

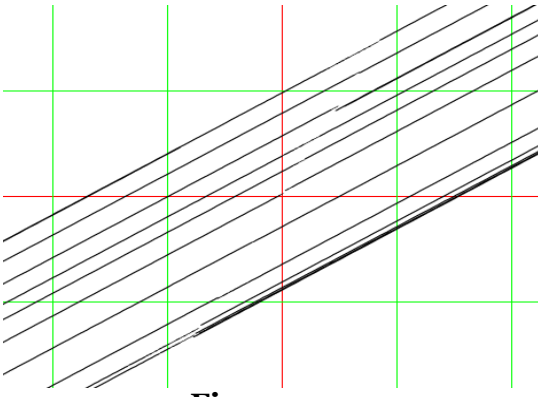

Fig. 3.5a

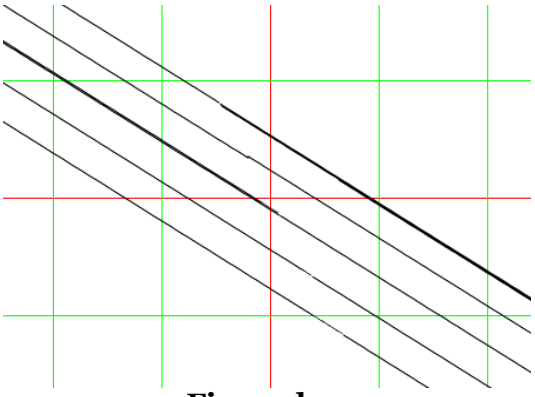

Fig. 3.5b

In the course of *updating of attributes of a synergy* at this stage the thesaurus relating to the theory of bifurcation analysis was first created. The term "bifurcation" became one of the key concepts which entered it. The etymology of this word is connected with the Latin word "bifurcus" which means *"doubled"*. We will bring one of its known definitions. Bifurcation — the concept used in some sections of mathematics in relation to situations when some object depends on parameter λ (not necessarily scalar) and in any vicinity of some value λ_0 of the last (bifurcation value, or a bifurcation point) the studied qualitative properties of object aren't identical to all λ (Prokhorov, 1988).

From the point of view of the systems of differential equations theory (and other functional equations, for example, integrated, integrated-differential) this concept describes the behavior of dynamic system consisting in acquisition of new quality of this system solutions at small change of its parameter (parameters). When parameter reaches some critical value, there are so-called *points of bifurcation* (differently *points of* possible ways *branching* of system development).

Secondly, *tasks for small groups of students* are developed:

- *for groups of analysts:* to carry out the display of equations; to investigate the solution on stability; to conduct the mathematical modeling and research of a phase portrait of system; to carry out the analysis of balance points, line isoclines and their movements in phase space;

- *for groups of programming and computer design:* to develop and realize the computer program of phase portrait visualization at various values of parameters (or for possibility of the fullest analysis of bifurcations cascade, for example, in Lotka-Volterra system, Kolmogorov model, etc.).

Stage 2. **Substantial and technological** —manifestations of mathematical education synergy directed on the development of adaptation stages of generalized construct of "problem zone" of higher mathematics to initial conditions of mathematical knowledge and ways of student's educational activity. Such activity of students is realized with reflection and research of technological parameters of functioning of adaptation system and receiving of new results. In this case the generalized construct of "problem zone" is "*stability of the decision of system of the differential equations"*. It is actualized by means of computer and mathematical modeling of processes with strange attractors and difficult predicted.

Main objectives of this stage: to master by means of mathematical and computer modeling substantial constructs of adaptation methods of generalized scientific knowledge to initial conditions of mathematical knowledge and ways of professional activity of students; to reveal and prove new mathematical results during development and research of generalized construct; to provide the high level of professional motivation of students; to reflect the thesaurus of mathematical education synergy during research activity; to develop probabilistic style of thinking and creative independence of students on the base of integrative knowledge and procedures development, designing of the contents, stages, basic and variable characteristics of experience; to develop the abilities to adapt, be improved in social communications on the basis of mathematical, information, natural-science and humanitarian cultures dialogue.

***Motivational field*:** mathematical and computer modeling of professional and applied situations of the concept interpretation "stability of the solution of differential equations system

with nonlinear members" (self-oscillation – Hopf's models, Van-der-Polya, three-specific competition, etc.; stochastic fluctuations – Lorentz, Rösler and Rikitake's models).

Forms: mini-lecture, laboratory and settlement occupations in small groups, seminars and scientific conferences, design methods, remote discussion forums.

***Means*:** mathematical and computer modeling, mathematical packages (MAPLE, MatLab, MathCad, Octave, SMathStudio, Scilab, GNUOctave, etc.); the modern languages of programming C ++, C#, Web- resources.

Tasks for updating of "problem zone" for small groups of students:

1. Give the interpretation of three-specific competition model on the basis of Lorentz's model, where $x(t)$ – flora size, $y(t)$ – quantity herbivorous, $z(t)$ – quantity of predators.

2. Interpret model of functioning of memory on the basis of Lorentz's model, where $x(t)$ –operative memory, $y(t)$ – short-term memory, $z(t)$ –long-term memory.

***Tasks for updating of synergy attributes in small groups of students*:**

- *for groups of analysts:* to reveal by means of mathematical modeling of limit objects and their characteristics depending on changes of initial conditions; to carry out the fullest bifurcation analysis of dynamic systems which include three and more equations, for example, Lorentz's model, Van-der-Polya, etc.

- *for groups of programming and computer design: develop and realize* the computer program of phase portrait visualization of dynamic system with application of modern languages of programming; to develop and realize with application of modern languages of programming the program for research of dependence of systems behavior in phase space from a variation of initial parameters (data).

Titles of projects: "Modeling of the movement of a body under the influence of linear springs in the environment having linear friction"; "Research of differential equations systems on the existence of isolated closed trajectories"; "Modeling of periodic modes arising in electric chains"; "Research of differential equations systems on emergence of Andronov-Hopf's bifurcation".

Stage 3. Estimated and correctional

This stage is characterized:

1) Assessment of methods and procedures of results finding, variation of task conditions and data, choice of an optimum solution of the problem. For example, if additional nonlinear indignations are entered into classical Lotka-Volterra system so the system can show the various cascades of bifurcations, including the gaps of honoclinic trajectories and the birth of limit cycles.

We will analyze the possibility of emergence of "bifurcation points" at change of differential equations system considered in a task 1 (stage 1). We will bring for this purpose in analytical record of this system some nonlinear components. On a phase portrait we will trace the changes in behavior of trajectories and show the bifurcation points**.**

Example 2. We will take system from a task 1 (case $\alpha = 2$). We will bring nonlinearity in the first equation. For example, we will write down system:

$$\begin{cases} \dfrac{dx}{dt} = -3x + 2 \cdot y + y^2 - 1, \\ \dfrac{dy}{dt} = -2 \cdot x + y. \end{cases}.$$

Let us construct the phase portrait using computer modeling (Figure 4).

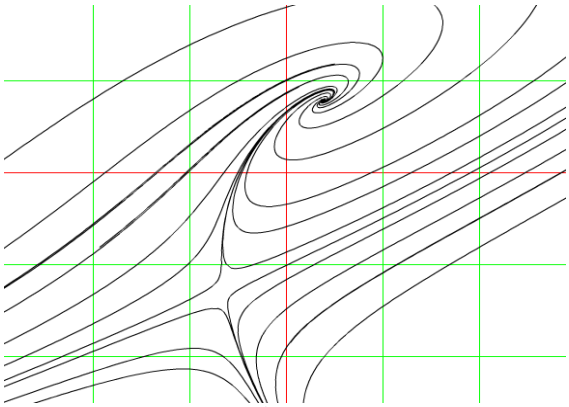

Fig. 4

We will alter the system of differential equations in which value of parameter was chosen $\alpha = 4$. We will bring nonlinear composed both in the first and in the second equations of the system. So the system of differential equations will assume the following form:

$$\begin{cases} \dfrac{dx}{dt} = -3x + 4 \cdot y - y^2 - 1, \\ \dfrac{dy}{dt} = -4 \cdot x + y + x^3 - 2. \end{cases}$$

We will have the phase portrait of this case in Figure 5.

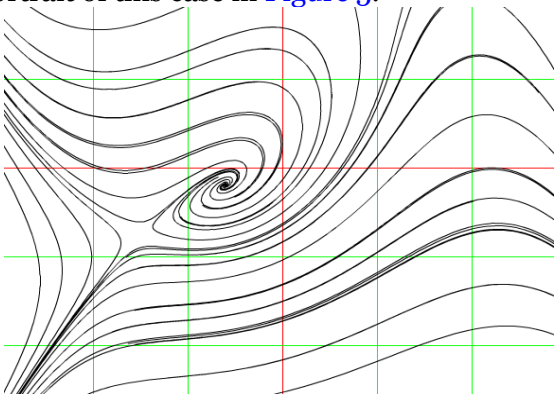

Fig. 5

So on Figure 4 and Figure 5 we show the bifurcation types "*focus-saddle*".

Let we have the differential equation system and it's phase portrait:

$$\begin{cases} \dfrac{dx}{dt} = -3x^2 + \sqrt{2}y, \\ \dfrac{dy}{dt} = -\sqrt{2}x + y^2. \end{cases}$$

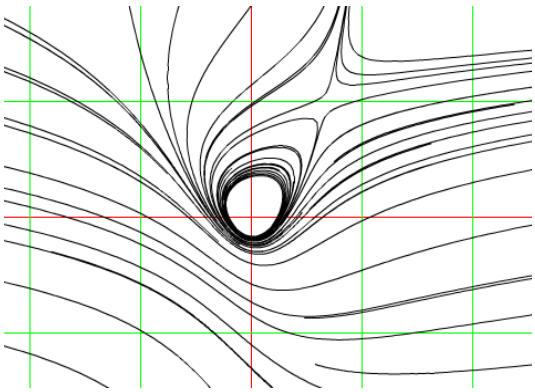

Fig. 6

Tasks: Characterize the changes which happened with differential equations system; compare its analytical record to one of earlier presented systems. Is there a bifurcation in Figure 6?

2) Monitoring of results of student's innovative activity, identification of positive and negative dynamics of parameters and indicators of cognitive activity, changes in experience and personal qualities of students.

Tasks for an assessment of cognitive activity results of students with synergetic effects:

- for groups of analysts:

The system of the differential equations and her phase portrait is given:

$$\begin{cases} \dfrac{dx}{dt} = 2x - 3xy, \\ \dfrac{dy}{dt} = 3y - 4xy. \end{cases}$$

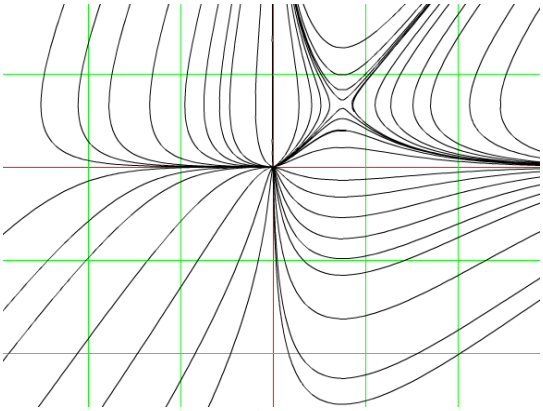

Fig.7

Specify the special points of this system of differential equations and define own values of the system; specify the stability type (or instability) by each of special points. For what description from following models serves this system of differential equations: a) Maltus's model; b) Ferkhyulst's model; c) Lotka-Volterra's model; d) Leontyev's model; e) Samuelson-Hicks's model?

- for groups of programming and computer design:

Task 1

1. Consider a situation when increase of demand for any products causes an increment of their release. Excess of demand for the first period of time t can be presented a difference

$$\underbrace{a_{11}x_1(t) + a_{12}x_2(t) + d_1(t)}_{demand} - \underbrace{x_1(t)}_{sup\,ly}.$$

Present the process of regulation for two sector economies (model "*expenses – release*") in the form of two differential equations system. As a result the system of the ordinary differential equations should be turn out:

$$\begin{cases} \dfrac{dx}{dt} = a_{11}x(t) + a_{12}y(t) + d_1(t) - x(t), \\ \dfrac{dy}{dt} = a_{21}x(t) + a_{22}y(t) + d_2(t) - y(t). \end{cases}$$

2. Present the received system in a matrix form and find its common solution at:

$$A = \begin{pmatrix} \frac{1}{5} & \frac{4}{5} \\ \frac{2}{5} & \frac{3}{5} \end{pmatrix}, \; D = \begin{pmatrix} e^{-\frac{t}{2}} \\ 4e^{-\frac{t}{2}} \end{pmatrix}.$$

Find the solution with: $x(0)=\frac{1}{6}$, $y(0)=\frac{7}{6}$.

3. Create an algorithm to solve this problem.

Task 2

1. Create the algorithm by using C++ for design of phase portrait to differential equation system with kind of nonlinearity as: $\alpha \cdot xy$, $\beta \cdot x^2$, $\gamma \cdot y^2$.

2. Build the phase portrait with the help of previous algorithm for differential equation system:

$$\begin{cases} \frac{dx}{dt} = -2x + 4xy + y^2, \\ \frac{dy}{dt} = 6y - 2xy - x^2. \end{cases}$$

3. Answer on the following questions with the help of Figure 8:

1) How many special points does this system have?

2) What are type and character of each special point?

3) Are there the bifurcation points? If "yes", then characterize the types.

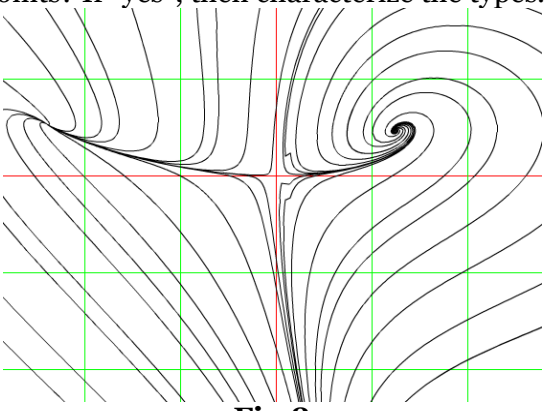

Fig.8

Stage 4. Generalized and converts

This stage is characterized by transfer of this model on various fields of knowledge where considered systems are open and there is no equilibrium. The task consists in the identification in considered systems of various fast changes, jumps, ruptures of a continuity, etc. Staying in models of systems of collective structures (focuses, limit cycles, strange attractors, etc.) by means of bifurcation analysis promotes the creative search, updating of motivation, development of cognitive activity of students in the conditions of mathematical education synergy. For example, the ability of model creation describing processes of thinking on the basis of actual information and ability to make recommendations for real practice can serve as characteristics, parameters and indicators of formation of individual style of future teacher activity. Process of thinking proceeds as follows: there are periodic fluctuations connected with steady limit cycles by receiving of brain information. Then there is a bifurcation and the system passes to steady focus with an unstable limit cycle and without cycle. During bifurcation the key information is generated and system passes to steady focuses with cycles and without. Thus it is possible to call a trajectory of steady focus as creativity (Milovanov, 2005). We will explain the ideas on a specific example.

Example 3. We will consider system:

$$\begin{cases} \dfrac{dx}{dt} = \alpha_1 x - \alpha_2 xy + \alpha_3 y; \\ \dfrac{dy}{dt} = \beta_1 y - \beta_2 xy + \beta_3 x, \end{cases},$$

where x (t) and y (t) are an information processed according to left and right by cerebral hemispheres of the person's brain; terms $-\alpha_2 xy$ and $-\beta_2 xy$ characterize the losses arising at exchange processes; components $\alpha_3 y$ and $\beta_3 x$ are the streams of information from the right hemisphere in the left hemisphere and from left in right respectively (Milovanov, 2005).

It can serve as one of possible mathematical models describing the mechanism of interaction between two cerebral hemispheres of the person's brain. This task plays an important role in such branches of modern psychological science as psycho-diagnostics and neuro-linguistic programming. Concerning the solution of this task it is important to establish the position of system balance, having described by formulas connecting coefficients of initial system and also to calculate Lyapunov's value by means of which it is possible to estimate stability or instability of model solution at the chosen values of system coefficients.

Let us put in present system: $\alpha_1 = 1$, $\alpha_2 = 3$, $\alpha_3 = 1$, $\beta_1 = 5$, $\beta_2 = 2$, $\beta_3 = 2$, then it can be right by following form:

$$\begin{cases} \dfrac{dx}{dt} = x - 3xy + y; \\ \dfrac{dy}{dt} = 5y - 2xy + 2x. \end{cases}$$

In this case the phase portrait of system will be designed on Figure 9. As we remark the equilibrium position for such coefficients choice is *unstable*.

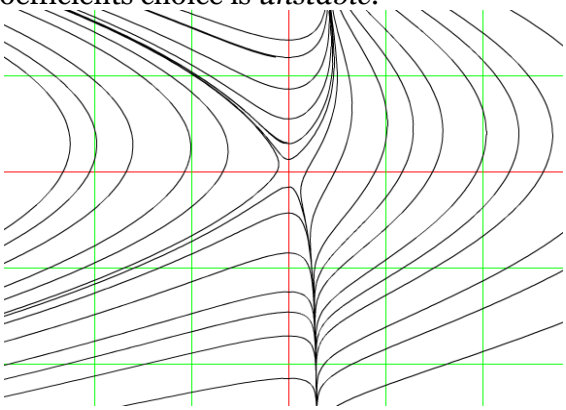

Fig. 9

3. Results of the study

The results obtained after the development and introduction in educational process of higher school confirm the thesis of efficiency the technology of synergy manifestation effects in the study of "problem zones". Phased development of complex educational construct in the adaptation process of developed system of professional–applied tasks by means of mathematical and computer modeling and design allows for enhanced educational and professional motivation of students, as well as the quality of the development and self-organization of mathematical activities. The developed technology was introduced in practice of training of the Institute of mathematics, science and technology Yelets State University named after I. A. Bunin in the period from 2016 to 2017 academic year. In the comparative analysis in the framework of the pilot study took part students of the 2-nd and 3-rd course full-time students on specialty "Applied mathematics and Informatics" at the age of 18 to 21 years. A pilot sample (n_1=12) consisted of students who studied with the introduction of innovative technologies in the discipline "Differential equations" (4, 5

semester). In the control group (n_2=11) the same profile the teaching of this discipline was carried out using traditional teaching methods (Dvoryadkina, Smirnov, 2016).

The effectiveness of technology was carried out on the basis of two criteria – the manifestation of cognitive effect (significant improvement in the quality of learning) and motivation (dominance of internal motives). Diagnostics of the quality of mastering the educational material was determined on the basis of final testing results in subject "Differential equations". The results of mathematical testing reflect the amount learned mathematical concepts, the completeness of ability formation to operate with concepts when solving professional and applied tasks, the depth of learning activity. To solve the problem of motivational effect has used a comprehensive methodology to determine the motivation of study at the University (ed. T. I. Ilyina) for diagnosing learners across the spectrum of internal and external motives: cognitive, professional, pragmatic.

For statistical analysis of experimental data used multifunction φ*– Fisher criterion allowed us to assess the significance of differences between percentages of the two samples with interesting synergistic effect (cognitive and motivational). The number of students score in the final mathematics test (K=75 and K_{max}=100) and three scales "knowledge", "mastery of the profession" and "get a diploma" the motivational criterion (M_1=9 and M_{max}=12,6; M_2=7 and M_{max}=10; M_3=7 and M_{max}=10), respectively, were considered as critical (Table 1).

Table 1. Diagnostic of cognitive and motivational effects manifestation

Groups	Cognitive criteria		Motivation criteria					
	Effect: K≥75	No effect: K<75	Effect			No effect		
			M_1 ≥9	M_2 ≥7	M_3 ≥7	M_1 <9	M_2 <7	M_3 <7
Control group	2(18,2%)	9(81,8%)	3(27,2%)	4(36,4%)	8(72,7%)	8(72,7%)	7(63,6%)	3(27,3%)
Experimental group	8(66,7%)	4(33,3%)	10(83%)	9(75%)	4 (33,3%)	2(17%)	3(25%)	8(66,7%)

Statistical test allowed us to reject the null hypothesis, which is that the proportion of persons who have manifested the investigated effect in experimental group more than in control group (φ^*_{exp}=2,468>φ^*_{cont}(0,01)=2,31 for indicator K; φ^*_{exp}=2,875> φ^*_{cont}(0,01)=2,31 in terms of M_1, φ^*_{exp}=1,914>φ^*_{cont}(0,05)= 1.64 in terms of M_2 and φ^*_{exp}=1,945> φ^*_{cont}(0,05)= 1.64 in terms of M_3). For internal motivation was studied the following characteristics:

– Educational -cognitive motives inherent in the learning process (interest in the profession, the desire to successfully learn, to acquire knowledge, to intellectual satisfaction, the ability to self-reliance, self-actualization, self-improvement);

– Preference of the complexity and volume of educational material;

– High cognitive flexibility in learning activities, creative solution of educational and vocational applications.

Analysis of experimental results has established the significant predominance of internal motivation (cognitive and professional motives) over external. Therefore we can conclude that the practical implementation of innovative technologies proves the efficiency of cognitive and motivational processes.

4. Conclusion

Note that ensuring the efficiency of cognitive processes in the development of mathematical activities depends on creating of saturated educational environment. This is possible in the investigation of "problem zones" of mathematical education with identification the essence of complex objects, processes and phenomena by computer and mathematical modeling means. Thus self-determination, self-actualization, self-organization and self-development reflect the complexity, openness, non-equilibrium studied meaningful constructs. In our case innovative

technology is implemented to study the "stability–instability of solutions of differential equations systems". Real experience shows a significant increase in educational motivation of students and improves the quality of coherent and agreed development of mathematics and computer science in the process to adaptation of modern achievements in science.

5. Acknowledgements

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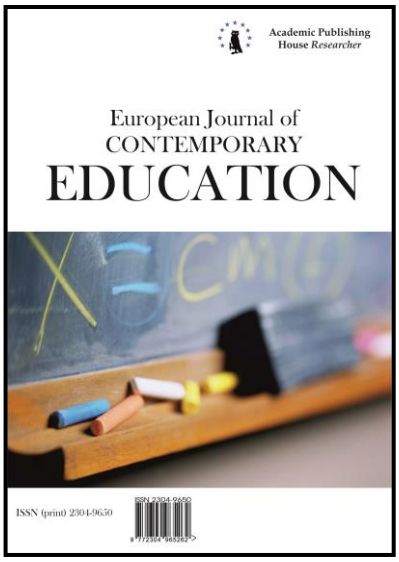

The Students' Research Competences Formation on the Master's Programmes in Pedagogy

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Abstract

The study area is to form research competences for Master's students in the process of mastering the educational programme. The aim of the study is to justify the model to form research competences and the mechanism for its implementation in the process of professionally-pedagogical training.

The research uses methods, such as content analysis of texts for professional standards such as Teacher & Specialist in education/Mentor. The method of determining the type of personality subjective relation with the environment, modeling a research University environment, and comparing Federal state educational standards for the educational level of undergraduate and graduate programs. The study was conducted at the Tyumen State University (Russia) in 2015-2017 in the framework of the Master's program in Pedagogy. The system of accompanying the research of the master students was introduced. Assessment of its effectiveness was carried out according to the master's theses defense reports.

The conducted research allows us to present and describe the model for student research competences formation in the process of implementing master's programmes. Model components are the forming of a social request based on the order from the employer and the introduction of research results into practice, creating a research module to elementary-wise refining steps required for entry into the research activities, saturating all academic disciplines and practices with research content to include students in the completed research cycle, and immersing students in the academic university environment in order to enrich it with the forms of research activities.

The conducted research has shown the effectiveness of the model for the formation of research competences. This model is implemented through the following mechanisms, such as individual support for students' research activities based on the type of subjective connection of the individual with the environment, work at the employer's request and immersion in the academic environment. Under these conditions, the inclusion of students in research raises the training

quality of teacher's education. Our research has shown that the developed model of the research competencies formation is successful.

Keywords: research competencies, educational programme, teachers education, Master's degree, content analysis, professional test.

1. Introduction

Graduate programs in the Russian education system have emerged recently, as a result of Russia's accession to the Bologna process. Much more remains to be clarified and modified, so that graduates of the master's degree will fundamentally differ in the quality of training from the graduates of bachelor's and specialty. It is encouraging that the process of the emergence of educational programmes at the master's level has been launched and is actively supported by the Ministry of Education and Science of the Russian Federation. According to the Federal Law of Education in the Russian Federation, one of the conditions for improving the quality of training for educational programs is "to attract students to conduct research under the guidance of scientists" (Federal law of Russia, 2012).

University professors are actively searching for content, forms and methods of work with the master's degree students. Nevertheless, many questions remain in the organization and content for training of future master's, such as Education in the Master's programme is aimed at training Professionals or Researchers? How is it possible to become both an expert and a researcher in two years of training, considering that a number of master's programmes, including pedagogical ones, can be done without a basic pedagogical education? What University professors should focus on to improve the competitiveness of their graduates?

A. Background.

In the world educational practice the issue of research competences formation is discussed quite widely. Researchers from different countries prove the need for development of teachers' research competence and disclose that this competence positively affects the quality of education.

Professor of Norwegian University of Science and Technology May Britt Postholm came to the conclusion that development of teacher educators' research competence can enhance development both in teacher education and in school. (Postholm, 2016). Khan and Chishti (2012) prove the necessity of formation of research competence of future teachers during their higher education at the University. «Competence is a fundamental element for delivering quality education and the teacher is a primary agent for imparting quality education. The target of quality education can be achieved once the quality of teachers». The authors attribute the quality of teachers with the development of their research competences. The way to achieve this is generating competence among research supervisors/university teachers-which, in turn, will have an impact on the quality in research work of students/supervisee (Khan, Chishti, 2012).

Researchers note the teacher's research competence is complex. Researchers at the Daugavpils University of Latvia conducted an analysis of the development of research competencies of doctoral students including 39 doctoral students of programme "Pedagogy". Three competency groups were identified: informative, communicative and instrumental. The authors came to the conclusion that «in general, in the structure of doctoral students' research the most poorly developed are the instrumental competences». The authors note a positive effect of the systemic formation of research competencies supported by the European Social Fund (ESF). (Olehnovicaa, Bolgzdaa, Kravale-Pauliņa 2015). Lambrechts and Van Petegem investigete the relation between competences for sustainable development and research. The authors discuss the possibility of the integration of competences and explores the contribution of research-based methods to acquire competences for sustainable development (Lambrechts and Van Petegem, 2016).

Vincentas Lamanauskas and Dalia Augiene (2016) prove teaching is and should be research based profession. The question was whether the students consider the research competence necessary. The authors concluded that students highly value scientific research activity significance to teacher's profession and understand this activity multifaceted influence on teacher's activity: both teacher's professional activity improves and teacher's personality. Researcher career aspect is obviously double-sided. Two basically equal groups have been discerned. One of them claimed, that their attitude to scientist career is positive and they express wish when having opportunity to do scientific work. The other half of students have negative attitude to scientist career and think, that

this is uninteresting, hard and poorly valued activity. However research showed, that even 70% of students understand SRA effectiveness as study process improvement. Continuous scientific research activity improvement and enhancing effectiveness is important in the study process. This study was conducted on the basis of two Lithuanian universities – Siauliai University and Lithuanian University of Educational Sciences.

A similar study was conducted by Finnish researchers. Hannele Niemi and Anne Nevgi (2014) have investigated how student teachers benefit from authentic researcher experiences as part of their pre-service education. The data were collected by electronic questionnaires at two Finnish Universities. Teacher education programs guided student teachers to use and conduct research in the teaching profession. The results indicate that student teachers value research experiences. Research studies promoted professional competences and supported students' growth toward evidence-based practice and 21st century skills.

Analysis of the results of modern research have shown that research skills can be learned and should be learned. Universities create special programmes for the development of research skills of teachers. For example researchers from the University of Tennessee (USA) and University of Milan Bicocca (Italy) describe a cross-cultural PD model for early childhood teachers in Italy and the USA. This model develops cross-cultural research competence and includes a cross-national exchange amongst two teacher communities within which teachers view practice in another context and engage in dialogue about their own and others' practices. The authors find that the developed model of participatory cross-cultural research is successful. (Morana et al., 2017).

Sabine Hoidn and Sibylle Olbert-Bock (2016) describe a newly developed research curriculum for management students implemented in a new master's programme in Business Administration at a mid-size university of applied sciences in Switzerland. Three pedagogical challenges in teaching research methods were addressed to target the theory-practice gap in management education. The authors opted for a research methods curriculum that links management research and practice by encouraging pluralism in knowledge-production forms, a more holistic view of competence development in management education and a learning-centred course design.

A curriculum for learning and research methods was designed for example in Radford university USA. Allison Wisecup presented a survey data for a sample of students who have and have not completed a research methods course. Completion of a research methods course is associated with more positive affect toward research methods and availability of greater cognitive competence in research methods knowledge and skills (Wisecup, 2017). So universities create special research methods courses and students find them useful.

In the framework of the teachers research competences formation, a special method is proposed. For example Anesa Hosein and Namrata Rao suggest a method of student research competencies formation – students' reflective essays of their research experience. Qualitative analysis of the students' reflective essay demonstrated that students showed an awareness of both their research skills such as choosing an appropriate research instrument and their researcher identity such as the metacognition of their research competence (Hosein and Rao, 2017).

The traditional way of the research competences formation is the students research paper under the supervisor guidance. Elaine Munthe and Magne Rogne (2015) believe undergraduate research is one way to qualify teachers for professional learning and innovation. They investigate how Initial teacher education programs in Norway address research for students. They come to conclusion that these programs emphasize research, but teacher-led more than student engagement. Therefore the first experience of the research will be obtained with the support of the scientific supervisor.

This article describes the system for the teachers' research competence formation in the Tyumen State University (Russia) on the basis of the Master's program "Pedagogy".

B. Conceptual approaches to organize research activities for master's students

The developmental value of scientific research activities in the field of teacher training for master's programs is to obtain a specialist of new quality who is capable of thinking independently, see problems and contradictions, and to find scientifically based productive solutions. The well-known classic of pedagogy Adolf Diesterweg argued that without a desire for scientific work, the teacher "will inevitably fall under the authority of three pedagogical demons: mechanicality, routine and banality" (Diesterweg, 1956: 322).

Pedagogical research has a number of fundamental differences that should be taken into account in training for the master of pedagogy.

Complexity of the subject of pedagogical research allows for "the allocation of certain positions and aspects" of a particular phenomenon or process. (Zagvyazinsky, 1995: 21). One and the same phenomenon, for example cognitive interest can be considered through the administrative, didactic, social aspect etc. Therefore, in the process of mastering the educational program of the master's level, students on the one hand must learn to immerse themselves deeply in the subject of research, while on the other hand to look at the problem widely; considering the subject under study in a diverse set of various conditions and circumstances.

The results obtained during pedagogical research are characterized by openness and incompleteness of conclusions. Hence, a pedagogical study conducted by one researcher cannot resolve all the identified problems. For example, the task to determine the factors, identify mechanisms, find and justify effective ways. This way, we can be sure that the next researcher will reveal additional factors and conditions. So, students in the process of mastering the educational program should form an understanding of the community, the openness of research, ability to compare the obtained results with the results of other studies and ability to predict the prospects of the research.

Pedagogical research cannot be a desk study based on secondary information/data obtained in the course of other studies. The pedagogical research should be based on primary information – it is data obtained as a result of a specially organized and conducted experiment or pilot study in the real pedagogical conditions. Therefore, students, when conducting research, should go to a specific educational area and be included in a real educational process. Only in this case pedagogical research will become a real professional test.

Modern reality is pragmatic enough to be apply to science. The resources spent on science should be justified. The best result of the research is an output on concrete decisions in the field of pedagogical reality. Identifying the trend, features, conditions for increasing the effectiveness of a particular educational process, it is necessary to think about the practical significance of the study. Therefore, scientific research in the field of pedagogy cannot be justified by the researcher's interest, but must have a social order, reasonable tasks of educational institutions and focus on putting into practice.

Pedagogical research takes place in a complex system of connections and relations in the field of education, upbringing and development of the individual. "At the same time, the growing and developing person is included in this process as a subject of education" (Zagvyazinsky, Atakhanov, 2006: 50). All this imposes high moral demands to organize, conduct and implement the results of the study. An experiment in pedagogy usually affects someone's interests, such as students, parents, teachers and managers. Standards of scientific ethics are not formulated in the form of any approved official decrees, but they do exist. Therefore, in the planning process of the formative experiment, there must be a check on morality. This topic should be discussed at all stages of planning and organizing a formative experiment.

Pedagogical research is carried out within the institutional environment, which puts "significant restrictions on the teacher's behavior" (Korthagen, 2004: 78). Here, various scenarios are possible, such as understanding the mission, beliefs and actions in accordance with the environment. But there may also be a situation, where the researcher might have to choose to refuse, or to carry-on the research and how to use its results. Therefore, in the process of training, students must gain the experience of coordinating the research at all stages of its planning, organizing and discussing with the official structures of the educational institution.

Certainly, the pedagogical research that accompanies teaching activity brings additional trouble, but this is a completely different level of pedagogical activity, which was termed "reflective practice" (Norton, 2009: 54). It is reflective practice that leads to positive changes in teaching. With all the complexities of organizing and conducting pedagogical research, an educator who accompanies his pedagogical activities by research will be distinguished by his readiness for development. This is the part of the teachers that can "enrich the theory with practice, which in turn can influence policy" (Norton, 2009: 38).

C. The purpose of the research is to justify the system for the teachers' research competence formation in the Tyumen State University (Russia) on the basis of the Master's program

"Pedagogy", to determine organizational and pedagogical steps during research competence formation .

2. Research methods

The study was carried out using the following methods:

–Content analysis of texts for two professional standards: (a) Teacher & (b) Specialist in education / Mentor was conducted. These standards cover pedagogical activities in the field of Preschool, Primary, Secondary & High School Education. Content analysis method made it possible to identify meaningful priorities in teacher's professional activity, to determine the place of teachers' research competencies. Pearson's chi-squared test ($\chi 2$) was used to prove the observed differences between the categories (types of teacher's professional activity) arose not by chance, but statistically significant.

–The comparative method was used to study federal state educational standards for the educational level of the bachelor's and master's degrees in the field of filling research content.

–Author's technique Irina Yemelyanova (2008, 120-126) by identifying the type of subjective connection of students with the educational environment of the university was used. With the help of this technique, we have identified types of relation between students and the educational environment, the behavior of students depending on the type of relation and their attitudes toward research activities.

–Method of modeling the research environment of the educational institution in the aggregate of interrelated components was used. We created, put into practice and justified the effectiveness of the model of scientific research competences formation.

3. Research activities in professional standards "Teacher" and "Mentor"

A professional standard is a document that defines the qualification requirements that an employee needs to carry out his professional activities. Professional standards are developed by the professional community itself and are accepted by the Ministry of Labour and Social Protection of the Russian Federation. Professional standards set the requirements not for the process of education, but for the level of education and for work.

To understand whether the teacher is carrying out research activities within the framework of his work activity, we have analyzed the content in two professional standards: Teacher (Act of the Ministry of Labour and Social Protection of the Russian Federation 2013) and Specialist in education / Mentor (Act of the Ministry of Labour and Social Protection of the Russian Federation 2017). Both these standards relate to the teaching field and can be used as a basis for the development of educational programs at the master's level.

Using the content analysis method we conducted a study to determine the proportion of research content in the professional standards "Specialist in education/Mentor" and "Teacher". The unit of analysis was professional actions, skills, knowledge which were described in the professional standards. Each professional action, knowledge, skill was attributed to one of the six teacher's professional activity: pedagogical, project, social- cultural, research, methodical, managerial. The frequency of the occurrence of the types of teacher's professional activities in the professional standards was calculated. The content that is reflected in the professional standards is presented in Figures 1 and 2. The general trend has been clearly demonstrated in professional standards, pedagogical, methodical and managerial activities are given priority.

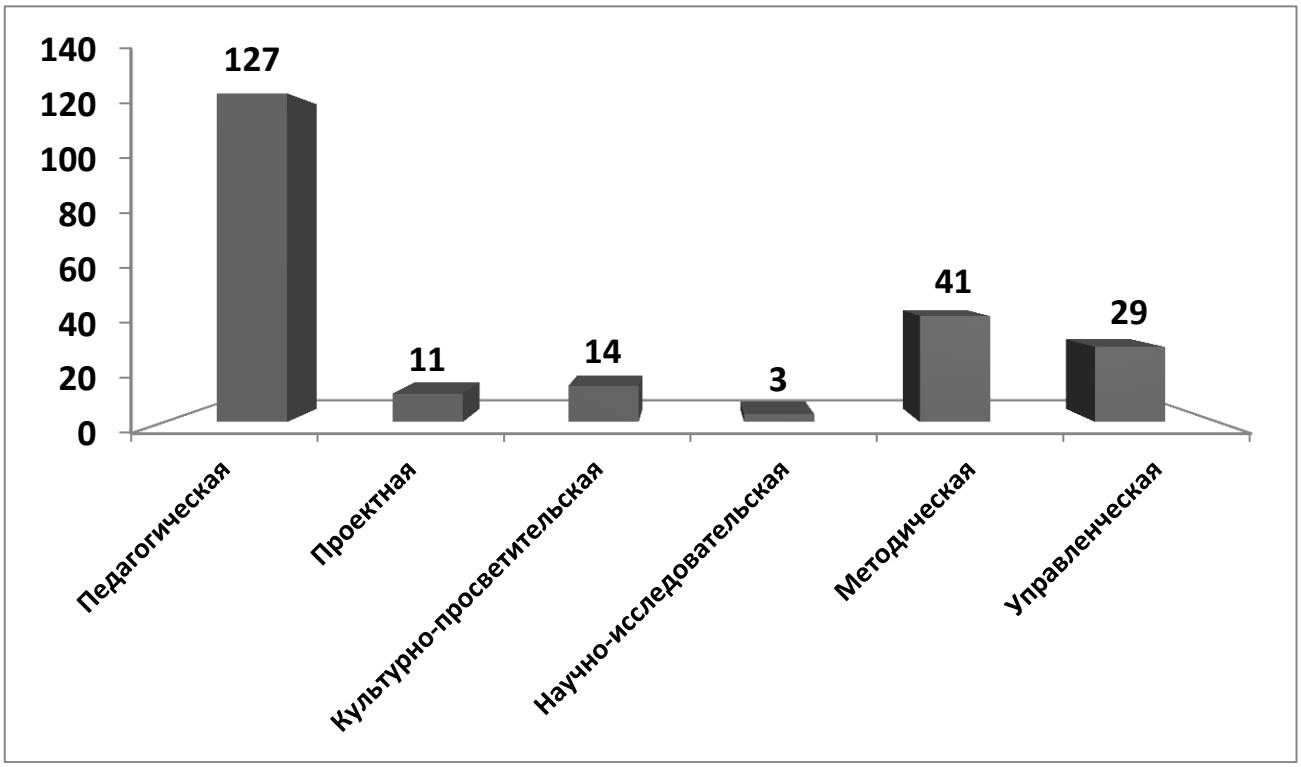

Fig. 1. Activities in the professional standard "Teacher"

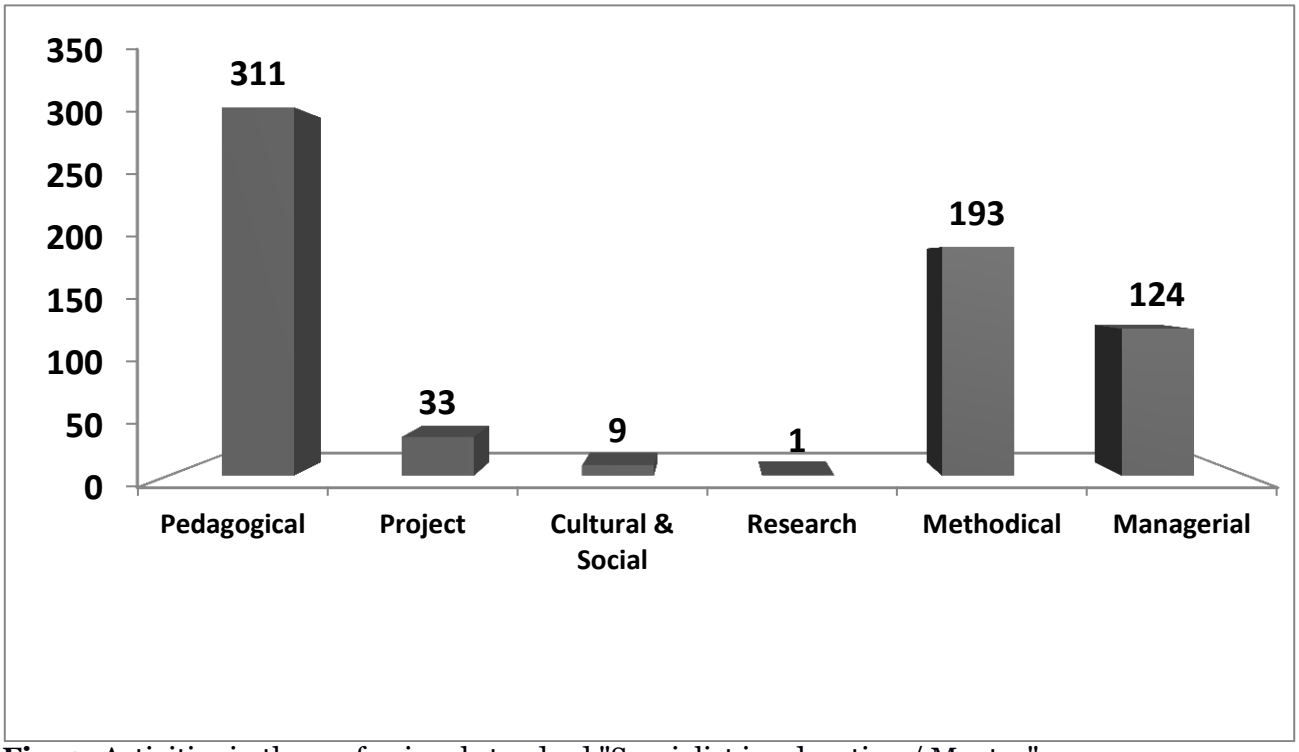

Fig. 2. Activities in the professional standard "Specialist in education / Mentor"

Pearson's chi-squared test ($\chi 2$) was used to prove the observed differences between the categories arose not by chance, but statistically significant. The value of the test-statistic was calculated by the formula:

$$\chi^2 = \sum_{i=1}^{n} \frac{(O_i - E_i)^2}{E_i}$$

The results of the calculation are presented in Table 1.

Table 1. The frequency of the occurrence of activity types in the professional standards "Specialist in education / Mentor" and "Teacher"

activity types(*i)*	Specialist in education / Mentor		Teacher	
	observed frequency (*Oi)*	expected frequency (*Ei)*	observed frequency (*Oi)*	expected frequency (*Ei)*
Pedagogical	311	112	127	38
Project	33	112	11	38
Cultural & Social	9	112	14	38
Research	1	112	3	38
Methodical	193	112	41	38
Managerial	124	112	29	38
Total	671	671	225	225
χ^2	675		281	

According to the calculation chi-squared test (χ^2) is 675 for the distribution of teachers' activity types in professional standard "Specialist in education / Mentor" and chi-squared test (χ^2) is 281 for professional standard "Teacher". Critical value χ^2 is 15,09 when the number of degrees of freedom is 5 (n – 1) and p=0,01. Critical value χ^2 is equal for both cases. Estimated value χ^2 is more than critical value for both cases: 675>15,09 and 281>15,09. Thus, the null hypothesis is rejected for both cases. Consequently, the deviations in the frequencies go beyond the range of random oscillations, that is, the variation are statistically significant.

The study showed that pedagogical content is frequently occurred. Methodological and managerial contents occupy also a significant place. Scientific content is reduced to an insignificant minimum. The conclusion is that the research activity for the teacher in the light of the professional standards of "Teacher" and "Specialist in education/Mentor" is not a priority. In fact, it is secondary.

Undoubtedly, "professional standards should form the core of curriculum of pedagogical specialties and used in assessing the professional qualities of the teacher" (Zabrodin, Gayazova, 2013), but professional standards are not a dogma. They should be creatively absorbed by the developers of educational programs based on the purpose of professional training.

Therefore, when developing curriculum at the master's level, it is not advisable to minimize scientific research activities and should not follow the priorities of the professional standards, which focus mainly on pedagogical, methodological and managerial activities. It should be understood that the appointment of professional and educational standards are different. Allocation of labor functions and labor actions in professional standards, allow to formalize labor relations to specify professional standards. The purpose of educational standards is the diversified professional development of the individual.

In the duties of a teacher or specialist in education (mentor), there are no requirements to conduct research. But the teacher who is conducting the research will be qualitatively different from the one who doesn't do the research. It is the researcher who has the ability of "reflective practice," capable of qualitatively improving the pedagogical process.

In the process of professional education, students must learn the methodology and technique of pedagogical research to seize certain elements of research activity, to reach the level of understanding to know the meaning of pedagogical research in the context of an educational situation.

4. Research competencies in educational standards Pedagogical Education of bachelor's and master's degree

Educational standards are adopted by the Ministry of Education and Science of the Russian Federation and establish requirements for the process and quality of education and educational programmes. Student competencies including the research skills are described in the Federal state educational standards: Pedagogical Education (bachelor degree) (Act of the Ministry of Education and Science of the Russian Federation 2015) and Pedagogical Education (master degree) (Act of the Ministry of Education and Science of the Russian Federation 2014). Educational programmes at the bachelor's and master's level have a number of fundamental differences in research competencies requirements.

There are different types of activities which students must learn during the training in bachelor's and master's degree. Among them there is research activity for bachelor students and scientific research activities for master students.

Bachelor students' research activity includes the use of research methods, formulating and solving research problems in professional activity. Master students' research activity includes analysis, systematization and generalization of scientific research results, cconducting scientific research in the education field independently, complex application of research methods for solving specific research tasks, the use of modern scientific methods and technologies. As we see, the research activity at the master's level is carried out much more widely and comprehensively.

An obligatory component of the master's curriculum is a scientific research conducting, for what credit units are provided in each semester. The basis for the master's thesis is the forming experiment. These requirements do not apply for bachelor theses.

The bachelor's and master's degrees are differentiated according to the requirements for pedagogical staff. At least 75 % of the teachers providing educational process in the master's programme, must have a degree of doctorate in science and an Academic title. Heads of the master's should regularly conduct scientific research and publish in domestic and international journals. For bachelor's degree lower requirements have been set: at least 50 percent of educators should have academic degrees of doctor or candidate of science.

Thus, the research competencies requirements in the Master's programmes are much higher than in the Bachelor's programmes.

5. Bachelor and Master Students: various research interactions with the educational environment

There are significant differences in the contingent, which is to be taught in undergraduate and graduate programs. We mean no age differences that objectively exist. We investigated the differences in the quality of interaction with the environment that the student establishes by studying undergraduate and graduate programs.

Irina Emelyanova (2008) has developed a classification of students according to their interaction with educational environment. Students were classified based on their contact with their educational environment in the following categories: (a) intellectual and creative (research), (b) pragmatic, (c) contemplative, (d) simulation and (e) mixed.

The author's technique of Irina Emelyanova was used in this study. The question was what is the share of bachelor and master students who has a research connection with the educational environment. The research was conducted in 2016 in the Tyumen State University in the Pedagogy and Psychology Institute. The survey included answers from undergraduate and graduate students studying in the pedagogy programmes. 63 bachelor students and 43 master students were questioned. They were diagnosed to identify the type of interaction between students and the educational environment of the university. The methodology included a list of questions in response to which students denoted the following types of communication with the environment i.e. intellectual-creative (research), pragmatic, contemplative, imitative and mixed.

The study revealed the following.

Types of interaction with the environment which are represented among undergraduate students of respondents: the intellectually creative type – 44.8 %, the pragmatic type – 20.5 %, contemplative type – 12.2 %, imitation type – 20.3 % and mixed type – 12.2 %. Graduate students gave the following observations of respondents: the intellectually creative type – 59 %, pragmatic type – 17 %, contemplative type – 2 %, imitation type – 2 % and mixed type – 20 %.

As we see, graduate students, more often compared to undergraduate students, establish an intellectual-creative type of connection with the environment. Among master students, unlike bachelor students the contemplative and imitative types of communication with the environment are negligible. This means that the master students are more conscious with creative or pragmatic goals and objectives. In our opinion, training at the master's level has substantial resources for organizing scientific research activity.

Nevertheless, among graduate students there are intellectuals and imitators. Behavior of different types of students will differ significantly in the situation of involvement in scientific research activities. Consider real-life examples.

Vasilissa (an Intellectual-creative type) had a pedagogical education and was a student at the undergraduate course, who actively participated in the Olympiads and was always successful. Now she is enthusiastically working on the topic of research and began to publish articles. Already in the first month of training in the master's program, she won first place in the regional competition of student scientific research papers. There are no questions with study in principle. Vasilissa actively applies for participation in conferences, she has also received a grant.

Alexander (Simulation type) has a bachelor's in pedagogical education and has established himself as a public figure. His studies never fascinated him. He likes interactive forms, where he gets the opportunity to present himself and does it successfully. But, since the start of master's training, problems with study have become apparent. The reason for this are varied forms of employment. With great difficulty he passed the session. Hence, the scientific research work that he provided was of poor quality.

Vasilissa more successfully mastered the scientific research competencies. Her active and creative attitude to intellectual forms of work was a necessary condition for the quality of mastering the educational program.

At the same time, the educational environment should help both Vasilissa and Alexander to develop and grow professionally. Vasilissa needs creative cooperation and assistance in advancing science but Alexander needs a step-by-step immersion in research, which would eventually lead to completion. The model of vocational training in the system of pedagogical education of the master's level, should create the opportunity for success in scientific research for everyone; in our case, both Vasilissa and Alexander.

5. The model of scientific research competences formation: University of Tyumen State case

5.1. Model components of the scientific research competencies formation in the University of Tyumen

The model of research competencies formation has been tested in the process of implementing the Master's programme "Methodology and methods of social education" in Tyumen State University since 2011. The general idea was to bring the educational situation closer to real practice by organizing professional testing or approbation. Professional approbation can be implemented in the following forms: (a) in a real educational process, (b) in the imitation training process and (c) in communication (Guruzhapov, Margolis, 2014, 148).

Research approbation within the framework of the master's program can and should be implemented in a real educational or learning process. Such professional approbation of a graduate student research activities is the master thesis, which should form research competencies.

The conceptual idea behind the model for the research competencies formation is to supplement and enrich the research module with the capabilities of all disciplines of the educational program and the scientific research environment of the university, so as to include students in the whole research cycle (Fig. 3).

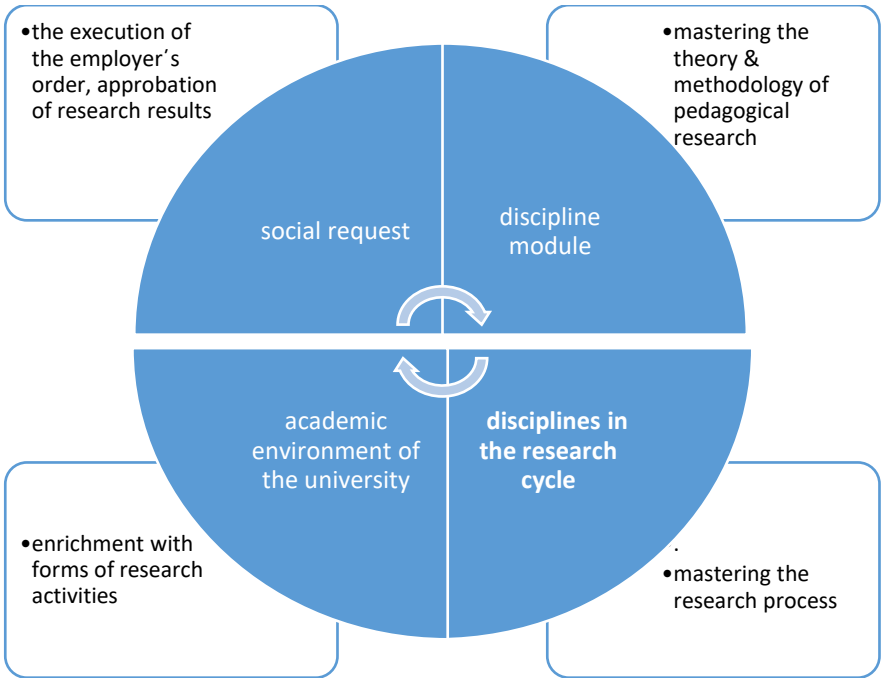

Fig. 3. Model for the research competencies formation

5.2. Executing the employer order and approbation of the research

Entry into research activity begins with the choice of a topic, corresponding to the profile of the training. Students have the right to propose a research topic. But it is more welcome to join those frontiers that determine the research priorities of the department, institute and university. Receipt of an order from the employer to develop and approbate the research significantly increases the practical orientation of the research project.

The institutions and organizations that formulated the research order, should be interested in its results, be ready to discuss them and under certain conditions, introduce them. Only then will the student's research be completed and the researcher will have a qualitatively new experience. The procedure for approving the topic, adopted at the Tyumen State University in master's programmes, involves the discussion of the research topic at the department. The condition for approval of the topic is its justification, including the research request from the employer.

Completion of the research is accompanied by the introduction of its results in the pedagogical process. The technique, program, methodology, technology, etc. can be introduced into the activity of the educational organization. A certificate of the implementation of the research results is provided for the defense of the master's dissertation. A certificate is not a pre-requisite for a thesis defense, but is advisable.

According to the reports of the Institute of Pedagogy and Psychology (Tyumen State University) for 2015-2017, 70 % of full-time and part-time students of the master's program provided a certificate of the research results implementation. This means that research results are actively used in practice.

These regulated procedures are equally important for all types of students. For example, Alexander is put in the necessary framework and is controlled by the Supervisors. Whereas, Vasilissa strives to develop and establishes productive professional relationships.

5.4. Mastering the theory and methodology of the pedagogical process within the disciplines of the research module

The student must acquire all the necessary elements of the research. The necessary and sufficient elements of the research module mean the mastering of the research structure and procedure in accordance with the training profile. For entry into research activities, subjects such as “Methodology and methods of research”, “Pedagogical experiment”, and “Qualitative and quantitative diagnostic methods” are necessary. These and other disciplines are needed to put the

research fragments piece by piece: to teach how to determine the problem, contradictions, subject, object, to plan a controlled and forming experiment etc.

While mastering the research module, students master the theory and methodology of pedagogical research within the framework of competencies indicated in federal state educational standards. Taking into account the variety of research competencies defined in the educational standard, it is advantageous to allocate clusters of competencies. A cluster of competences is a set of closely related competencies, combined according to certain criteria. Combining competences within the cluster, allows you to identify the essential characteristics in the professional training and create the appropriate evaluation means.

From the educational standard 44.04.01, Pedagogical education (master's level), the following clusters of research competences have been singled out by us: analytical, information, project and communicative (Table 2).

Table 2. Educational result on mastering the research module

Cluster of research competences	Content	Forms
Analytical	Analysis of pedagogical facts at various stages of the study	Essay, analytical report, interpretation of fact
Information	Work with information: documents, scientific articles, monographs, Internet resources	Abstract, summary, literature review, synopsis
Project	Preliminary assessment, pedagogical experiment, final assessment.	Research project, model defense, solution of complex situational task
Communicative	The use of various forms of scientific communication in the process of selecting, discussing and approbating the research	Report, presentation, article

Each cluster assumes the appropriate content and forms of work, which will be measured.

5.5. Mastering the research process in all educational disciplines of the educational program

Research activity assumes mastering all logic of scientific search, but not separate elements. The exploratory search involves successive steps that begin with defining contradictions of real practice and end with the introduction of research results into practice. Therefore, mastery of research competences cannot be limited to mastering individual elements of the study. It must assume the passage of the entire research cycle.

Therefore, it is necessary to attract resources not only from the disciplines of the research module, but from other academic disciplines and practices. Each academic discipline has its own content and organizational resource (assignments, tests, term papers) that can be used in the organization of pedagogical research. Using these resources, allows us to build a holistic research cycle, which in turn helps students to master the logic of conducting independent research. Exploratory search is a logically constructed cycle that begins with the definition of contradictions in real practice and ends with the introduction of research results into practice.

An example of organizing and supporting the pedagogical process is the cycle of research activities of students developed by the Department of General and Social Pedagogy of Tyumen State University (Table 3).

Table 3. Cycle of the research module implementation within the educational program "Methodology and methods of social education"

Semester	Research activities content	Disciplines practices	Educational result
1	Determining the relevance of the topic and the research problem and the designation of contradictions. Introduction to basic documents.	Modern problems of science and education.	Defining the problem and research topic. Forming of a source base.
1	Research methods learning and collected material analysis.	Methodology and methods of scientific research.	Defining the object, the subject of the study and the procedure for research. Drawing up an individual research plan.
	An analysis of the real educational situation on the indicated research problem.	The pedagogical practice.	Determining the contradictions of real practice in the context of the problem under study.
1,2	Literature review on the research topic.	Business foreign language	Annotations of foreign articles on the research topic.
2	Organizing and conducting pedagogical experiment or experience description.	Pedagogical experiment	Planning of ascertaining and forming experiment.
	The study of the peculiarities of the research organizing and conducting in educational organization (depending on organization type).	The pedagogical practice	Conducting a pilot study on the topic of the master's dissertation.
3	Diagnostics of the separate area conditions for education or upbringing.	Monitoring the development environment	Selecting diagnostic techniques on the research topic.
	Making research materials. Preparing the presentation. Discussing the results of the research.	Scientific-pedagogical practice	Conducting of the ascertaining experiment.
4	Formulating the concept. Revealing scientific novelty and practical significance of the research.	Innovative processes in education	Formulating scientific novelty and practical significance of the study.
	Conducting a formative and summative experiment.	Pre-diploma practice	Presentation of materials.
4	Formalization of research results.	Preliminary thesis defense	Formalization of scientific results. Preparing the text of the master's dissertation.
4	Defense of the master's thesis	State attestation as a teacher	Master's degree

5.5. Enrichment with forms of scientific research activities in the university academic environment

Pedagogical research cannot be a study of one person. It should be actively discussed by the scientific community. This requires an appropriate scientific environment. Academic environment of the university should create conditions for mastering additional specific forms of scientific-research activities which are not provided by the educational program: grant writing, participation in conferences, methodological seminars , intellectual competitions.

Experience has shown that students enrolled in the Master's program are able to participate in grant activities, prepare scientific articles and win scientific research competitions. But to include students in additional forms of research activities, incentives are needed that encourage development. For example, in the case of students such as Vasilissa and Alexander. For Vasilissa it is important to perceive the spirit of research, to learn how to enjoy the intellectual process, to pass through the expectation of discovery and the excitement of how your fellow students and scholars will meet your study. As for Alexander, the academic environment should give the first successful samples, which must be carefully accompanied by research scientists, which in the future can give birth to scientific interest.

6. Conclusions

Pedagogical educational programs at the master's level should be focused on the training of educators & researchers, who are able to see problems in reality to set research tasks, to understand the meaning of conducted research, and to be responsible for the implementation of research results in the real educational process.

The conducted research has shown the effectiveness of the model for the formation of research competences. This model is implemented through the following mechanisms: individual support for students' research activities based on the type of subjective connection of the individual with the environment, work at the employer's request and immersion in the academic environment.

Experience in the implementation of the p*edagogical* educational program of the master's level showed: the formation of students' research competences will be effective if:

The research module allocated as part of the educational program will be focused on mastering the basic elements of scientific research, which should be consistent with the specifics of pedagogical activity.

The educational programme on the basis of all educational disciplines and practices will ensure the students' inclusion in the completed research cycle, that enables students to master the logic of pedagogical research.

The choice of destination and research topic will be based on the employer's order and will become a real professional test for students.

The scientific university environment will create conditions for approbation of research results and enable student to master additional specific forms of research activities which are not provided for in the educational program.

Under these conditions the students' inclusion in scientific research will raise research training in the system of pedagogical education to the level of the educator-researcher who has the skills, ability and readiness to conduct scientific research; while possessing a formed research interest in the phenomena of professional life.

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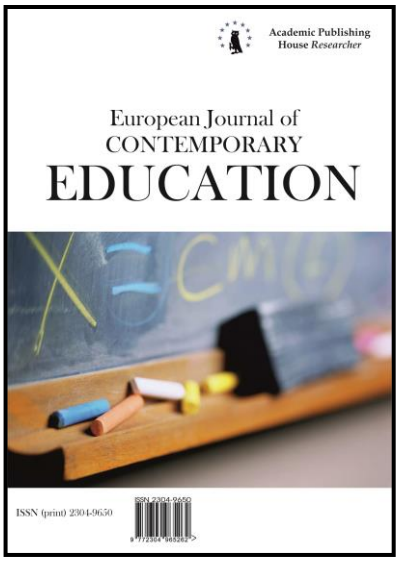

Professional and Personal Qualities of the Teacher in the Context of the Psychological Safety of Educational Environment

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Abstract

The article deals with the phenomenon of psychological safety of the educational environment (PSEE) in the modern school. Indicators of the educational process participants' psychological safety are revealed. The notion of the teacher's preparedness for the designing activity is defined. The authors have conducted a case study revealing integrated professional and personal qualities of the future teacher, which promote successful designing of school PSEE. The obtained data correlation has been made to identify the interconnection of the level of the teacher' professional and personal qualities development and the PSEE coefficient.

Obtained results of the case study have shown that the main factors determining the successful designing psychologically safe educational environment by teachers is the level of professional and personal qualities development such as emotional stability, high-normative behaviour, sensitivity, low anxiety, creative thinking, reflection and introspection. The carried out correlation has shown that the higher the level of manifestation of these teacher's professional and personal qualities is, the higher the psychological security of the educational environment is.

Keywords: psychologically safe educational environment, the future teachers' preparedness for designing activity, professional and personal qualities.

1. Introduction

Contemporary sociocultural space contains many factors negatively influencing the development of the human personality. Safety of the environment in which a person exists becomes one of the most relevant and meaningful features. It comes to the safety in almost all spheres of modern life. The term "psychological security of the educational environment" has recently appeared.

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Psychological safety of the educational environment expressed in preserving and strengthening its members' health, creating safe working and training conditions in an educational institution, protecting from all forms of discrimination may serve as an alternative to aggressive social environment, psycho-emotional and cultural vacuum; the consequence of which is a growing number of sociogenic diseases. An important condition of reducing a number of stress situations is an effective training of future teachers to design psychologically safe educational environment, development of their necessary professional and personal qualities (Fedotenko et al., 2013).

The object of research is professional and personal qualities of the teacher.

The purpose of the study is to study the influence of personal qualities of the teacher on the process of designing a psychologically safe educational environment of the school.

To achieve the purpose, the following tasks have been set:

– to conduct a theoretical analysis of the Russian and foreign research on the issue of designing the psychological security of the educational environment of the school;

– to clarify the tool of concepts: psychological security; psychologically safe educational environment; designing activity; the future teachers' preparedness;

– to develop diagnostic program that lets explore the level of psychological security of the educational environment of the school;

– to identify the level of development of the teacher's professional and personal qualities determining the creation of the psychologically safe educational environment.

2. Materials and methods

The case study has been aimed at identifying the interconnection between the level of psychological security of the educational environment of the school and the level of the teacher's personal qualities. The total number of respondents participating in the study has consisted in 74 schoolteachers in Tula. The study has been conducted in two phases: the first phase has involved performing procedures directed to identify professional and personal qualities of teachers. The second phase has included the diagnosis of the educational environment in which teachers work in terms of its psychological security. The closing phase of the study revealed the relations between the level of professional and personal qualities of the teacher and the safety level of the educational environment. Developed psycho-pedagogical diagnostic program with diagnostic techniques and investigated criteria is presented in Table 1.

Table 1. Psychological-pedagogical diagnostics of the development level of personal qualities of the teacher and the level of psychological safety of educational environment

PHASE	Methodology of the study	Investigated criterion	Indicator of the development level (stens)		
			low	*average*	*high*
I	16 Personality Factors Questionnaire (R. Cattell)	Communicative properties *(A, H, E, L, N, Q2)*	1-3	4-7	8-10
		Intellectual properties *(B, M, N, Q1)*			
		Emotional properties *(C, F, H, I, O, Q4)*			
		Regulatory properties *(Q3, G)*			
	Creativity Checklist by D.L. Jonhson (modified by Ye. Tunik)	Creativity of thinking *(Ct)*	8-19	20-26	27-40
	Methods of diagnosing the level of reflexivity (A.V. Karpov)	Reflexivity and introspection *(Ri)*	≤113	114-147	≥148
II	The average coefficient of psychological security of the educational environment				

	The questionnaire for the teachers and students 'Psychological diagnosis of the educational environment' (I.A. Baeva)	The safety factor according to the teacher *(PsT)*	≤5	6-11	≥12
		The safety factor according to the student *(PsS)*			

The questionnaire 'Psychological diagnosis of the educational environment' by I.A. Baeva includes worksheet for teachers and students consisted of nine questions each in answering which it is necessary to choose a priority or to assess the state of a phenomenon according to a given scale (Baeva et al., 2011). The following examples of survey questions can be given:

«Select only the five most important from your point of view of the following characteristics of the school environment and evaluate them on a 5-point system»:*

1. Relationships with teachers 2. Relationships with students 3. Emotional comfort 4. Ability to express their opinions 5. Respectful attitude towards yourself 6. Saving of personal dignity	7. Ability to ask for help 8. Ability to take initiative, to be active 9. Consideration of personal problems and difficulties 10. Attention to the requests and suggestions 11. Assistance to choose their own solutions

* 1 – to a very large extent; 2 – to a large extent; 3 – medium; 4 – to a lesser extent; 5 – not at all.

«How secure do you feel in school?»

1. From public humiliation 2. From insults 3. From derision 4. From threats 5. From offensive name-calling	6. From the situations when you are made to do anything against your will 7. From ignoring 8. From disrespect 9. From unfriendly attitude

* 1 – not fully protected; 2 – unprotected; 3 – difficult to answer; 4 – protected; 5 – quite protected.

As a theoretical and methodological basis of the study the following works are determined:

– scientific researches which study measures to protect its members and the prevention of violent methods: I.A. Firedman, J. Hathaway, E.G. Fell, M.A. Reeves, L.M. Kanan, A.E. Plog;

– scientific approaches to the study of education as a system of the designing of educational space: G.A. Kovalev, I.A. Kolesnikova, E.A. Kryukova, V.V. Rubtsov, V.I. Slobodchikov;

– theoretical and empirical research of the psychological safety of the school educational environment and interpersonal relationships of its members: I.A. Baeva, Ye.N. Volkova, Ye.B. Laktionova (Baeva et al., 2011).

3. Results and Discussion

In the first phase of the case study, diagnostics of professional and personal qualities of the teacher has been carried out (Maliy, Yugfeld, 2016). Using the technique "16 Personality Factors Questionnaire" by R. Cattell, we have determined the levels of development of teachers' professional and personal qualities. The Creativity Checklist by D.L. Jonhson (modified by Tunik) has revealed a level of teachers' creative thinking. To diagnose the level of reflectivity development, the method by A.V. Karpov has been used. The results are presented in Figure 1.

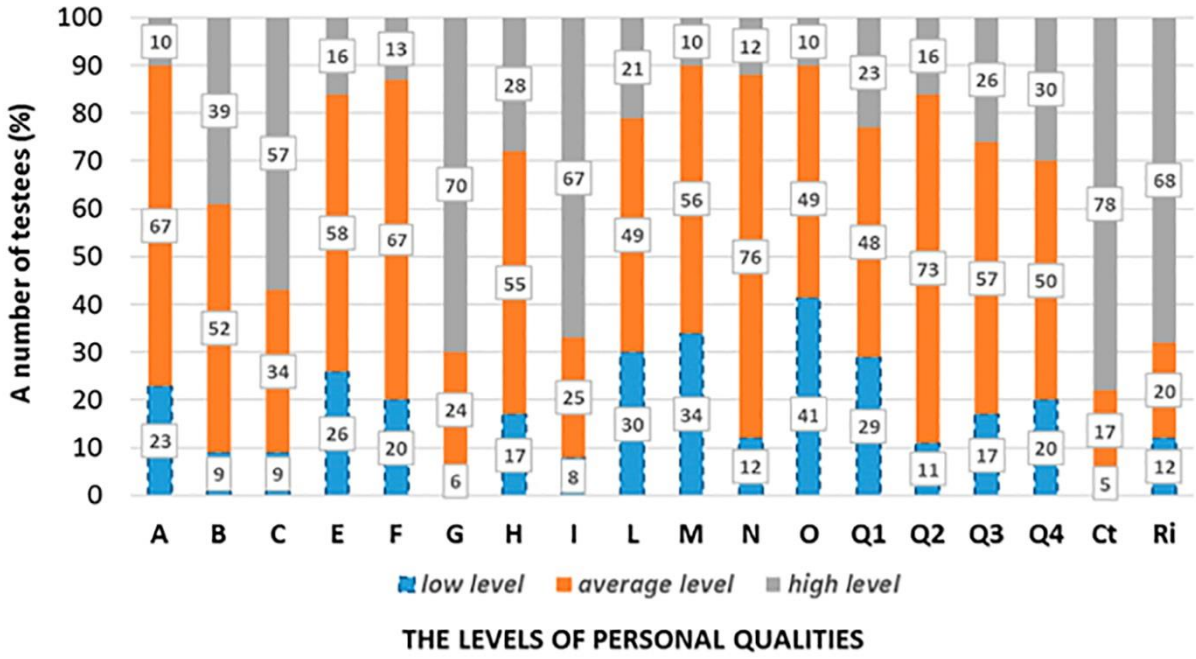

Fig. 1. Distribution of testees by the levels of personal qualities

According to the results of techniques, it can be observed the accentuation of the following vocational and personal traits: emotional stability (C); high-normative behaviour (G); sensitivity (I); anxiety (O); creative thinking (Ct); reflection and introspection (Ri).

According to the factor ***«C»*** – 57% of testees are characterized by high level of emotional stability that describes them as sensitive, emotionally mature personalities oriented to the reality; able to comply social moral norms.

According to the factor ***«G»*** – 70% of testees are typical of high-normative behaviour that defines them as honest, responsible, balanced personalities. These teachers are characterized by a developed sense of duty and responsibility, the conscious adherence to generally accepted moral rules and norms, persistence in achieving goals.

According to the factor ***«I»*** – 67% of testees are inherent in high sensibility. The teachers are characterized by sensual perception of the world, developed aesthetic interests, artistry, a penchant for empathy, sympathy, and understanding of other people.

According to the factor ***«O»*** – almost a half of testees (41%) has shown low level of anxiety. This group of teachers is distinguished by cheerfulness, confidence, and adequate behaviour with students, calmness, and no tendency to the hypochondriacality. Low levels, according to the given factor, characterize personalities who cope with their failures, that determines their successful leadership in complex situations and the personality's desire for the self-actualization.

According to the criterion ***«Ct»*** – most testees (78%) are typical of creative thinking. Creative teachers are able to observe the creative potential of children and create conditions for its development. They build special capacity including organization of particular creative atmosphere aimed at the emancipation of the personality; training to special methods and techniques of creating original products; development of psychological culture and creative thinking. The creative thinking is an indicator of highly organized and proper human kind of activity.

According to the criterion ***«Ri»*** – for 68% of teachers it is characteristic high level of reflection development expressed in the ability of teachers to analyze what is happening, to correlate their own actions with situations and to coordinate in accordance with changing conditions and own state. This group of teachers is typical of the analysis of future activity, behaviour; planning and forecasting of the likely outcomes.

In the second phase of the case study a survey of teachers and students was conducted by questionnaire 'Psychological diagnosis of the educational environment' by I.A. Baeva that let us identify the coefficient of psychological security of the educational environment (Baeva, Bordovskaya, 2015).

According to results of the questionnaire, the average coefficient ***Ps*** of the level of psychological security of the educational environment is calculated which is made up of figures obtained from the survey of teachers (***PsT)*** and students (***PsS)***. After analyzing the results, we can state the following: 62% of respondents have identified educational environment in which they fulfil the professional and educational activities, as a relatively psychologically safe; 34% have assessed the coefficient of psychologically safe environment at a high level; and only 4% – at a low level.

In order to establish the relationship between the teacher's accented personality traits identified in the first phase of the experiment and the coefficient of psychological security of the educational environment (the second stage), R-Pearson correlation has been conducted; given calculation is made using the program *Statistica* (Table 2). According to statistical processing, it can be stated as follows:

First, there are identified directly proportional relations between the criterion **Ps** and criteria **C** (r = 0.67); **G** (r = 0.79); **I** (r = 0.82); **Ct** (r = 0.72); **Ri** (r = 0.78). These relations are expressed in the following statement: the higher the level of development of the mentioned qualities of the teacher's personality, the higher the psychological security of the educational environment in which there are the subjects. The correlation coefficients (r) by all criteria is more than 0.65, at α = 0.05, which indicates a strong correlation.

Secondly, there is an inversely proportional relation between the criterion **Ps** and criterion **O** (r = -0.67), i.e., the higher the coefficient of the psychological security of the educational environment of the school, the lower the anxiety level of subjects of the educational process. The correlation coefficients in this case is r = 0.86, at α = 0.05, which indicates a strong correlation (Table 2).

Table 2. Correlation of development levels between personal qualities of the teacher and psychological safety of educational environment

	Personal qualities / the correlation coefficient (r)					
The level of psychology safety educational environment **(Ps)**	***C***	***G***	***I***	***O***	***Ct***	***Ri***
	0.67	0.79	0.82	-0.67	0.72	0.78

The question of the responsibility of the teacher for the development and well-being of the child in the educational process is becoming increasingly important; it gets a new meaning. Modern educational environment contains many examples of the negative behaviours of teacher and student in relation to each other: school harassment, psychological pressure, violence, bullying, and murder (Fedotenko, Maliy, 2013). Reducing the level of psychological and physical violence becomes the focus in creating a comfortable, psychologically safe educational environment. Providing by the teacher the necessary conditions for the child's personality development contributes to getting the experience of positive emotions, updating their reserve capacity; it increases self-esteem and self-confidence.

Considering the particularities of the teacher's activity in designing school PSEE, it is necessary to clarify its leading characteristics. The conceptual essence of the approaches to define the psychological security of the educational environment is reflected in the following terms:

– degree of the national educational system's security from adverse external and internal influences for the comprehensive development of individual, family, society and the state;

– interaction environment, free from acts of psychological violence, which has a referential significance for the included subjects (in terms of a positive attitude towards it) and is characterized by a predominance of the humanistic centration of participants (i.e. centration on the interest (manifestations) of its essence and the essence of the others), and is reflected in emotional-personal and communicative characteristics of its subjects;

– security system for subjects from the threats to positive development, physical and mental health in the process of pedagogical interaction;

– result of a comprehensive, systematic, long-term, specially organized psychological and pedagogical process, the result of which is recorded in the presence of: humanistic educational orientation; involvement of the individual in the educational process on a subject position; presence of significant communities for students ensuring the satisfaction of its needs in interpersonal communication; existence of the relationships based on mutual respect.

Thus, designing of a psychologically safe educational environment is a complex process that, on the one hand, involves modelling of the pedagogical process, its objectives, principles, contents, forms and methods chosen by taking into account the main purposes of the PSEE conception and, on the other hand, creating a safe psychological and pedagogical conditions which promote the development of skills and individual-personal characteristics of students.

4. Conclusions

Views of foreign researchers about the content and structure of a safe learning environment can be divided into two main groups. The first group whose views are within the dichotomous model, considering physical and social parameters of the educational environment. The second group proposes a model that reflects a complex structure with many different elements. One example of a successful model for the safe environment offered by the American experts Robers, S., Zhang, J., Truman J. (Robers et al., 2010) They include two indicators in the discussion of the safety of the educational environment: objective indicators, facts that can be documented by school administration and local authorities; indicators based on opinions and estimations of participants of the educational environment

Among the main ways to create a safe educational environment at school foreign researchers M. A. Reeves, L. M. Kanan, and A. E. Plog (Reeves et al., 2010) note the following:

– from the perspective of an integrated approach the interaction of different social structures should be fulfilled: providing of psychological-pedagogical and academic support to students, together with briefings on security;

– application of multi-level system of support, including preventive measures, improvement of psychological state, providing of efficient and intensive services based on children's needs and ensuring closer cooperation of the school with various organizations;

– increase in the availability of school support for the mental health through the recruitment of highly qualified staff – appropriate professionals who are able to implement preventive and efficient services in the educational process, and to integrate services provided by the school partners into the existing school system;

– constant maintenance of a favorable environment and compliance with safety regulations for the prevention of crisis situations;

– achievement of a balance of physical and psychological security to avoid excessive restrictive measures (for example, armed guards and metal detectors, which can then disrupt the educational environment).

We regard the psychological safety of educational environment as the most important condition, which allows giving it developmental nature, affecting the psychosocial well-being of all subjects (Fedotenko, Maliy, 2013). The indicators of the psychological safety of schoolchildren are (Kulikova et al., 2017):

– lack of fear of the teachers, free cooperation with them;
– questions of the child, their number and nature;
– autonomy and independence of the child from the opinions of others;
– successful establishment of relationships with peers;
– satisfaction of the school environment conditions;
– low level of anxiety, frustration and stress;
– positive feeling of subjects of educational process.

At the same time, the environment is not limited to relationships; it also includes the physical space of the educational institution (its state, colour, design, and organization). Unified educational space is created due to educational policies aimed at preserving and strengthening the physical, mental and social health of all subjects of the education system (Kulikova, 2012).

Most educational psychologists consider the preparedness of the future teacher to the planning activity as the ability for the selection and distribution of assignments-tasks aimed at the forming of the necessary qualities of the students' personality, knowledge, skills and abilities

needed in their future activity. A.K. Markova (Markova, 1993) emphasizes the ability of the teacher to design and form students' missing levels of activity, the ability to expand the field of self-work both with weak and gifted children building individual programs for them. We are closer to the position of L.V. Blinova (Blinova, 2015), emphasizing the importance of the teacher's ability to overcome barriers and to develop ways to eliminate the emotional discomfort resulting from the stereotypical perception of the situation, which involves a routine, uniformity and monotony in the teacher's organization of the education process.

Thus, we understand the future teacher's preparedness (Maliy, Medvedev, 2014) to design a psychologically safe educational environment as an integrative formation of teacher's personality, including a system of significant professional and personal qualities and the ability to model the pedagogical process with the main purposes of the PSEE conception.

By results of our case study h it is possible to draw the following conclusions:

1. It has been clarified the concept of 'designing psychologically safe educational environment' which we consider as a complex process involving modelling of the pedagogical process taking into account the main purposes of the PSEE conception and creation of safe psychological and pedagogical conditions that encourage the development of skills and individual personality characteristics of students.

2. The main indicators of the psychologically safe educational environment have been allocated as follows: lack of fear of the teachers, free cooperation with them; questions of the child, their number and nature; autonomy and independence of the child from the opinions of others; successful establishment of relationships with peers; satisfaction of the school environment conditions; low level of anxiety, frustration and stress; positive feeling of subjects of educational process.

3. Under the preparedness of the future teacher to design a psychologically safe educational environment, we understand integrative formation of teacher's personality, including a system of significant professional and personal qualities and the ability to model the pedagogical process with the main purposes of the PSEE conception.

4. According to the results of the pilot study, it can be stated that the main factors determining the successful designing of psychologically safe educational environment by teachers is the development level of professional and personal qualities of emotional stability; creative thinking; capacity for reflection; humanistic orientation of the personality; empathy; tolerance. The carried out correlation has shown that the higher the level of manifestation of these teacher's professional and personal qualities is, the higher the psychological security of the educational environment is. Regularity has been also revealed: the lower the level of anxiety of educational process is, the higher the psychological security of the educational environment is.

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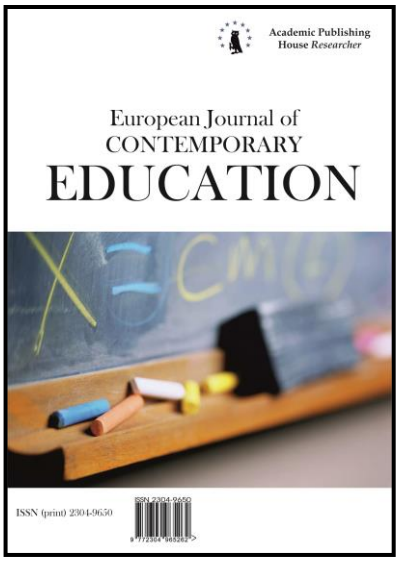

Gender Analysis of the Development of School and University Theme in Soviet and Russian Audiovisual Media Texts

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Abstract

The article is written within the framework of a broader study investigating school and university representation in the Soviet/Russian and foreign audiovisual media texts. The research outlines that in Soviet cinema the image of the female teacher was transformed in the following sequence: a heroine-revolutionary; a heroine of hard work; an intellectual; an educator-innovator; a victim; a bureaucrat-administrator. In the Soviet audio-visual texts of the 1930s-1940s, the heroic image of a teacher-fighter for revolutionary ideals (*Alone*, 1931), which gradually softens, acquires the aspect of labor heroics (*The Village Teacher*, 1947). Teachers become good-looking, attractive (*The Village teacher, First-grader*). The cinema of the Stalin era is characterized by the image of the teacher as an indisputable perfection, the embodiment of tranquility and justice.

The theme of motherhood for female teachers in Soviet / Russian cinema is either not raised at all, or is sublimated into maternal care as a quality characteristic of a woman in general, revealing the essence of the heroine, but directed not at her own child, but at a pupil. Often screen teachers are childless women with a failed personal life, single mothers, or mothers who conceal their motherhood.

The image of the male teacher was transformed in the Soviet / Russian cinema in the following way: the ideological organizer of the labor commune; a teacher by vocation, an enthusiast; an intellectual-humanist; a loser who finds himself at school due to unfortunate circumstances; an idealist, an ascetic, a self-sacrificing teacher, first and foremost a professional in his field.

In Soviet cinema, for many years, the masculine image of a teacher-the creator of a new man worthy to live under Soviet power-was being formed. In perestroika and in the Russian periods,

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images of male teachers, who have not found another road in life, began to appear on the screen more often. For all that, it is with the male teacher that the theme of innovation in education is connected in feature and documentary films, although this aspect is rarely shown on the big screen.

Keywords: gender analysis, audiovisual text, school pupils, school, teacher, educator, cinema, masculinity, femininity.

1. Introduction

In August of 2017, the General Director of the All-Russian Center for the Study of Public Opinion (VCIOM) V. Fedorov stated that at the moment a clear demand for changes is being acknowledged in Russian society (Moskvin, 2017). Judging by the lyrics of the song *We are waiting for changes* by the late 80's and 90's cult rock band *Kino*, the need for changes is not exclusively a distinguishing feature of modern times. The anticipation of changes is inherent to a person both as a single individual throughout his life, and as a member of society which development is associated with continuous changes in its political, demographic, economic and cultural spheres. Social changes as a mirror are reflected in the educational environment, affect the main actors in the educational process: teachers and students. In this regard, it seems pertinent to trace the media transformation of the social roles of men and women engaged in education sphere.

2. Materials and methods

The object of the study is media images of men and women engaged in education. The subject of the study is the media representation of masculinity and femininity of male and female teachers.

As a method of research, qualitative gender analysis was used, in the course of which the roles, norms, values, character traits prescribed by the society to women and men engaged in education, through the socialization systems (including the media), division of labor, cultural values and symbols, including assumptions, stereotypes and prejudices against male and female educators. Researchers emphasize the relevance and importance of applying gender methodology for studying the transformation processes that directly affect the relationship of men and women in society, because "they provide an opportunity to analyze the component of social transformations associated with the change in cultural norms and relations between men and women that occurs at all levels of public system, having a profound impact on the course of the transformation process and the formation of its leading trends. Thus, the possibility of understanding and explaining the social transformations is enlarged, the theoretical and methodological potential of the Russian social sciences and humanities and its use is enriched" (Zdravomyslova, 2008: 5). The gender approach is used by specialists not so much as a specific research method, but rather as a "strategy, a set of techniques and procedures used ... to study the principles of organizing people's lives and activities" (Latina, 2011: 10).

The material of the study was provided by audiovisual media texts as evidence of events, social phenomena, and facts, and namely, Russian films on school and university theme from the post-revolutionary period to the present day, contemporary documentary films and TV shows.

3. Discussion

In modern science, social and cultural phenomena and processes are widely explored from a gender perspective. The development of gender studies is considered as "a condition for democratization and humanization of both society and the institution of science" (Latina, 2011). Foreign researchers, for instance, A. Blickhäuser and H. von Bargen, consider gender as an important criterion in solving economic, industrial, social, social and political problems, in the development of society as a whole and of an individual; as a structural category, which allows to differentiate society according to age, ethnic origin, religion, sexual orientation and way of life, physical abilities and their limitations, social status, value orientations, level of education, attitude to the institution of family and marriage, etc. To avoid discrimination in society and the privileged position of certain groups and individuals, the need to integrate gender diversity is emphasized (Blickhäuser, Bargen, 2015: 11-15).

Through the prism of the problems of gender, films and television series have been analyzed, namely, images of femininity and masculinity in works by female filmmakers (Sputnitskaya, 2016); masculinity of male staff in secondary schools (Suspitsina, 2002). Researchers have considered gender images transmitted by Disney animation as a factor in influencing the formation of

behavior and the adoption of gender culture by children and adolescents (Talanova, Shakirova, 2014); the image of a femme fatale in American noir movies and the notions of sexuality, the distribution of gender roles, the structure of the family, characteristic of the era of the 1940s and early 1950s (Novikova, 2015); women's images as a reflection of changes in the socio-political history of post-revolutionary Russia (Khloponina, 2017), in the Soviet films of the "thaw" period (Mishchenko, 2012), etc. Moreover, the representation of female images in visual media texts (Dashkova, 2013) has been analyzed.

As the main narrative motif in the cinema of post-revolutionary Russia, one can point out the woman's way from an old life to the new one, her transformation from a victim of the traditional social model into the heroine of modern times. O. Khloponina, analyzing the patterns of leading female types in the 1920s' films, describes the following: "The "heroic" type is the main one in films intended to reflect the changes in life, the new way of life and visualize the achievements and ideas of the new power, whereas the" mother's" type is not needed as an inherent value, but is intended to illustrate the difference between the position of a woman before and after the revolution ... The emphasis is on the ambivalence of the victim and the heroine ... every woman goes her own way, and her transformation occurs, though with the help of a representatives of the new collective, but is still connected with individual self-improvement" (Khloponina, 2017: 142-144). As a result of the analysis of the cinematic representation of female types in the 1930s, the author came to the conclusion that the heroic type of a woman was gradually softened and intellectualized. The markers of the new femininity were optimism, accuracy, cheerful nature, that was invariably accompanied by hard work, enthusiasm, strength, health and indispensable connection with the collective (Khloponina, 2012: 148).

Whereas in the post-war years the role of the heroines of hard work, science, sports, and arts was epically reflected in the Soviet cinema, in the early 1960s the transition to the image of individual, but quite ordinary, nice girls and women, was made. In the "thaw" period, as noted by T. Mishchenko, a special socio-cultural environment determining the private space, was a family. The interest in the woman's personality in Soviet cinema replaced typical images of pretty, cheerful women with female images of bright texture, originality, and complex spiritual world (Mishchenko, 2012: 136).

As can be seen from the above, experts have mainly considered female media images in the context of gender studies.

4. Results

Following A.Fedorov (Fedorov, 2017) we have conditionally divided the films of Soviet and post-Soviet cinematography on the school and university theme as follows:

- films of the post-revolutionary period (1919-1931);
- films of the Stalin era and early post-Stalin years (1932-1955);
- films of the "thaw" period (1956-1968);
- films of the "stagnation" period (1969-1984);
- films of "perestroika" (1985-1991);
- films of the Russian period (1992-2016).

The analysis of the representation of male and female teachers in audiovisual texts was guided by the following criteria:

- the main problem in the solution of which, the teacher is involved as a media text character in a certain historical period;
- the social status of the teacher (position in society as a whole, among colleagues, among students);
- class affiliation;
- equality of rights between men and women;
- age, appearance, character traits and behavior of the teacher;
- level of material well-being of the teacher;
- life priorities (attitude towards family, work, children);
- models of privacy regulation;
- participation in decision-making.

Few of the Soviet silent films somewhat connected to educational venue have survived. Dramas *Road to Life* (1931) directed by N. Ekk and *Alone* (1931) directed by L. Trauberg and

G. Kozintsev served the material for our analysis. The first film demonstrates a solution to the problem of children's homelessness, the second deals with illiteracy of the population, especially in remote rural areas of the country. *Road to Life* accentuates male images, while the female ones are underrepresented. None of the supporting female characters has a name. There are no leading female characters at all.

The protagonist of the film is the commune leader Nikolai Sergeev wearing the military uniform of the time. He cannot be called a teacher in the conventional sense of the word, since he does not teach literacy, he teaches how to live off the fruits of one's labour. His goal is "to melt street orphans into the workers of the world construction". He enjoys authority among the children, his relationship with them is built on trust, he lets his pupils make decisions independently, mindfully. He seems to be on equal terms with them – he eats at the same table, however, in the frame he is visually a head taller than the boys, that takes the issue about his status off the table. It's a boys-only commune. The question of the way to deal with homeless girls orphans is unanswered in the film, which is understandable: building a railway, driving a locomotive is the lot of men. The only female character – a homeless girl with a bright defiant make-up and a set of typical health problems of children from the street, defines her status as a "street-walker".

In the Soviet era, gender differences between men and women according to the ideology of the state were unified, which manifested itself both at the level of verbal and non-verbal communication. "Do you think, comrade, that these children should be isolated?" – a male member of the committee on orphans refers to his female colleague. Expressing approval, the man slaps his colleague hard on the back, in response, she breaks into a smile. In a friendly manner, with a dry handshake, young people who are in love are saying goodbye in the drama *Alone*.

In the drama *Alone* the main character is almost a girl, a recent graduate of a Leningrad pedagogical undergraduate school who dreams of getting married and having a house with beautiful furniture, is assigned to work in a distant Altai village. According to the ideology of the young Soviet country, "lovers of comfort are enemies of Soviet power". The message of the film is to show how a teaching profession turns an immature young girl prone to philistinism into a dedicated teacher who heroically defends the ideals of Soviet power in the fight against the kulaks (wealthy peasants). The teacher in the film is neither a woman, nor a mother, but foremost, a builder of the Soviet socialist future, the new "good life". The film characters live not in the present, but in the future: a keynote of the whole film is "what a good life it will be!"

One of the indicators of good life of the Stalin era was the introduction of universal secondary education in the countryside, which became one of the main directives of the third five-year plan for 1938-1942. The main expectations regarding the behavior of men and women teachers of this period will be considered using the example of the films *The Teacher* (1939), directed by S. Gerasimov and *The Village Teacher* (1947) by M. Donskoy. In both films, the protagonists are teachers. The teacher by vocation Stepan Lautin is a calm, balanced and modest man. He intentionally returns from the capital to his native village in order to teach, but he encounters misunderstanding of his fellow villagers: "He who's not healthy enough, or doesn't have the skills, can start teaching" – grandfather Semyon comments the Lautin's intention to stay. According to stereotypes of rural residents, a man in the countryside should be a worker, not a thinker. The status of a rural woman, changed due to Soviet power, is represented by Stepanida, an uneducated, semi-literate woman, whom the authors of the film demonstrate as a remnant of the past and emphasize the change in her outlook. Stepanida joins the women's working brigade, who in St. Peter's day, when Christians are not supposed to work, founds the school building. Teacher Lautin is an authority among children and youth. However, at first he has to prove his worth to his elder fellow villagers, and first of all his own father, who does not appreciate the sincere desire to be useful and do good in his home village. He perceives the son's return home from the capital as a failure, disappointment, and is ashamed of it.

Similarly to Lautin, the main character of the film *The Village Teacher* (1947), a graduate of the privileged boarding school for girls in the capital, Varvara Vasilevna, guided by noble intentions, takes up teaching in a distant Siberian village. In the film, the teacher is feminine, refined (in contrast to the village women she is "urban, does not wear valenki (felt boots)", very sincere, seemingly soft, but strong-willed and high-toned (there's an ideal discipline in her classroom).

However, nothing human is alien to her. She is the same comrade, only a woman. She is a loving, caring, faithful, patient, affectionate wife. If her husband, Commissar Martynov, had not passed away too early, she, for sure, would have become a wonderful mother. She takes mothering care of her pupils. For example, Voronov is like a son to her: she sees him off to university, then – to the front and after the war, she is the one who's waiting for him. Her life is aimed at serving the Motherland, not armed with a gun, but by educating and upbringing children.

The ideological component of the film is vivid in the scene when Martynov (the red commissar from the gentry by birth) tells her: "You will be Lenin's favorite soldier". The words *favourite* and *soldier*, in our opinion, do not combine well, however they accentuate the fact that if you want to become a soldier, gender is not taken into account.

At the beginning of the film, an idealist Varvara Vasilievna believes that "a time will come" when a peasant's son will be able to study on an equal basis with the children from the privileged class (compare with the phrase "a new good life will come" from the film *Alone*), but unlike *Alone*, in this movie this time does come. In *The Teacher* and *The Village Teacher* besides the process of professional development, the result of his/her work is demonstrated – career growth as recognition of distinguished service to society. Thus, the village teacher is awarded the Order of Lenin and finds her echo in the pupils – Dunya Ostrogova, who becomes a teacher, and other schoolgirls who dream of becoming a teacher like Varvara Vasilievna. Stepan Ivanovich Lautin makes it from a teacher to the school headmaster, and then a candidate for deputy of the Supreme Council.

I.V. Stalin's death in 1953 entailed changes in the life of society, the most significant of which fall to the period of the "thaw" after N.S. Khrushchev's exposure of "Stalin's personality cult" at the 20th Congress of the CPSU in 1956.

Within the "thaw" period, we analyze the school theme on the example of the films *The Spring in Zarechnaya Street* (1956) directed by F. Mironer and M. Khutsiev and *We'll Live till Monday* (1968) by S. Rostotsky. Unlike previously reviewed, these films primarily deal with human relations and secondarily, with people of a certain profession, translators of a certain ideology.

The female protagonist in *The Spring in Zarechnaya Street* is Tatyana Sergeevna Levchenko, a graduate of the Pedagogical Institute, an intellectual (Rakhmaninov's music, a portrait of Blok and a pile of books are the most valuable objects in her rented apartment); she teaches the Russian language and literature at school for working youth. Emphatically invulnerable, she adheres to an authoritarian style of behavior, keeps a distance with students who are sometimes older than her.

This female image in many respects echoes the image of the protagonist *We'll Live Till Monday* Ilya Melnikov, a history teacher. Having quit work on his Ph.D. thesis, he plays "Lonely Wanderer" by E.Grieg on the piano, is intolerant (makes sharp remarks to a colleague who makes mistakes in speech), sometimes is even arrogant; strict and respected both by students and colleagues; lives with his mother, and even at home, like a hermit crab, only seldom comes out of the shell. However, behind outward rigor and irony Melnikov tries to hide the acute inner conflict that he is experiencing. In addition, he is in love with his former student and current colleague Natasha Gorelova, but hesitates to open his feelings to her.

In *The Spring in Zarechnaya Street* the inner feelings of the female protagonist are also demonstrated in relation to her status of a teacher that does not allow her to think of her grown up students as representatives of the opposite sex (Tatyana Sergeevna is emphatically strict with a steel factory worker in love with her), yet the film's authors create the picture of a woman capable to love and to be loved.

S. Rostotsky's film exemplifies the signs of the "thaw" period when it became possible to write and speak about happiness, about simple everyday feelings: "We were not given such topics, we wrote most often about typical representatives", the young English teacher comments on the essay assignment for high school students. In the Soviet school, the theme of family and motherhood was not common to discuss. The teacher of the Russian language and literature Svetlana Mikhailovna is a prude. In her opinion, schoolchildren must not speculate on simple women's happiness, and to dream of "being the mother of two boys and two girls" (the 16-year-old schoolgirl writes about it) is shameful. Svetlana Mikhailovna categorically condemns this "soul striptease", especially as "boys are present in class". Although in a private conversation with her colleague, Svetlana Mikhailovna bitterly admits that she lacks happiness, simple, feminine, with a baby, because "teachers have a problem with that".

As D. Bykov argues, this screenplay identifies that we did live until Monday which came after the Soviet Sunday, after the Soviet thaw, and a sad, gloomy Monday arrived (Bykov, 2015) – the period of the so-called stagnation.

Yet, it is difficult to agree with the totality of D. Bykov's conclusions by looking at the flamboyant comedy by A. Korenev *Big Break* (1972), where there is no trace of sadness.

The main character of *Big Break* Nestor Petrovich Severov is an arrogant, haughty young man, "a step away from the Ph.D. title", is preparing for postgraduate program. "I was watching you and decided that you deserve me," Severov tells the girl he liked. Knocked off his own pedestal (i.e. having failed the entry exams for postgraduate study), he voluntarily exiles himself to school for working youth, clearly realizing that "pedagogy is his calling". In the very first lesson, awkward, "small one, unattractive", he removes the mask of "superintelligent masculinity," behind which there is a sad, love-lorn young man. The school faculty is exclusively female. Among the supporting characters there is Svetlana Afanasyevna, a teacher of the Russian language and literature, an attractive blonde with a childlike face, forced to hide her happy marriage with a same-age student, thus in a way, at a new time loop and in a comic genre, reinforcing the Soviet media stereotype of the 1930s- 1940s, that a teacher is a woman above marriage, the school is her home, and the pupils are her family.

Nevertheless, the teacher's need to realize her gender – to be a mother, to care for a child – is quite visible in the Soviet cinema of the 1970s. So, the female protagonist of the film *Other People's Letters* (1975), Vera Ivanovna, realizing that both she and her boyfriend are "some kind of single, nonpaired people", and therefore, there is no hope for creating a family, gives a home for a schoolgirl, who is growing up without mother. Vera Ivanovna is having an affair with a man, and a part of their personal correspondence falls into the hands of her foster daughter/pupil Zina, who is rude, sometimes cruel, noone has explained to her that reading someone else's letters is bad. The girl is indulgent to her benefactress: "she lives in a different dimension, and does not know life at all," Zina says.

The theme of what's right and wrong is continued in the film by D. Asanova *The Key That Shouldn't Be Handed On* (1976), which depicts the image of an innovator teacher and education difficulties associated with a non-standard approach to the system. A young teacher of literature Marina Maksimovna, a talented teacher who encourages the desire of schoolchildren to reflect on acute topics, express and defend their opinion, the one who enjoys respect and authority among schoolchildren, suddenly finds herself in an ethically sensitive situation ... As a matter of fact, like Vera Ivanovna from *Other People's Letters*, Marina Maximovna is not married, so her gender role as well fits into the media stereotype of a "lonely female teacher" who has entirely devoted herself to work.

During the period of "perestroika", the themes of school and university were covered mainly in dramas (*Fun of the Young*, 1987, *The Doll*, 1988, *Temptation*, 1987, etc.). The plots were often built on the struggle of the opposites: the teacher and the student. The film's authors placed honesty, intelligence, and absolute social insecurity of the teacher (regardless of gender) in the scales against adolescent cynicism, impudence, impunity, and non-recognition of authority. Thus, in the film *Fun of the Young* (1987), Anton Gorshkov, an elderly, lonely, seemingly untended, strict, sometimes rude P.E. teacher nicknamed as "Pot", has to resist the group of the technical college students who decided to discredit the teacher who "crossed the line" (i.e. gave unsatisfactory marks). The situation, conceived as a game, got out of hand and ended with the beating of a teacher, who was forced to leave the city, and impunity of teenagers. Teachers have appeared as victims in other perestroika films (*Dear Elena Sergeevna*, 1988, *Homo Novus*, 1990). Yet, again, one can see an obvious gender coloring of a teacher as a victim: it were female teachers who became the targets of school pupils' atrocity.

In the film *The Doll* (1988), the teacher of mathematics Elena Mikhailovna (beautiful, very feminine in contrast to other teachers, for example, the head teacher – a burly, heavy woman in an unisex brown suit) confronts Tanya Serebryakova, an ex-athlete, cynical, sometimes cruel and at the same time deeply unhappy teenage girl. The 9th graders love their class teacher, however, they do not recognize her as absolute authority. The reason for this is her liberal approach to the students (this liberalism allows her to even afford an affair with one of her senior pupils). In accordance with the ideological orientation of perestroika to democracy, Elena Mikhailovna puts to the vote the question of her being a class supervisor. A noteworthy fact, testifying to the

expansion of the boundaries permitted in the school environment, is the very situation of the schoolstudents' discussion in the presence of the teacher whether she is worthy of being a class teacher.

Once again, as in *Other People's Letters, The Key That Shouldn't Be Handed On* and *Dear Elena Sergeevna*, a teacher from The Doll is a lonely, single woman deprived of male support.

The school theme is widely and multifaceted presented in the feature films of the Russian period. In the drama *Everybody Dies But Me* (2008), school is like prison: the teacher is searching school children at the entrance to the school disco, etc. The gender roles of high school female students are aimed at actively searching for a sexual object and aggressively competing, including physical violence.

Light is the Night (2004) introduces the female image of the principal of the boarding school for the deaf-blind. She is a coldish, dry, sometimes tough teacher, suffering from (as in many films of the Soviet period) loneliness and covert pain. Impeccable at work, she is capable of sacrificial love in life. Outwardly almost not expressing her feelings, she can be both passionate and "bitchy" (Matizen, 2004).

The drama *Uchilka/The Teacher* (2015) by A. Petrukhin, only features female school faculty: the school headmistress Agnes Andreevna Veverova is a young, good-looking, elegant woman whose handbook is a calculator; her secretary Liya Pavlovna, an elderly, tastelessly dressed woman (as her boss remarks, "how can you dress like that, children are looking at you!"), and the leading character Alla Nikolaevna, a history teacher for over forty years, restrained, intelligent, a middle-aged lady, a typical "blue stocking". Driven crazy by offensive behaviour, cynicism and indifference of students, Alla Nikolaevna takes a gun in her hands in order to handle her pedagogical task: "to lead the pupils of the 11th class to the path of truth and reason, so that they do not dishonor their country and themselves". Yet again on the screen there is an image of a lonely woman, deprived of a warm family hearth, a teacher who, in fact, unlike her "perestroika" colleagues, is able to stand up for herself...

The melodrama *The Village Teacher* (2009) features the image of the functionary school principal. Agrippina Sidorenko is an attractive, well-to-do woman, a conservative, cynical leader with a formal approach to work, who prefers to get rid of the problem rather than solve it, but is forced to reckon with Tikhonov, a young history teacher – an idealist who believes in the miracle of pedagogical art and "is ready to fight for the children and their souls". Having failed to fit into the system of an elite lyceum in Moscow, a handsome, intellectual, single Lev Tikhonov moves to a remote village with the romantic name Razdolye to be able to teach history in a new way, to involve schoolchildren in an interactive learning process. Actually, he is one of the few images of positive male teachers in contemporary Russian cinema.

The positive male image of the innovator is also relevant for modern documentary films. Hence, the television series *Looking for a Teacher* (2012) presents unique author's schools successfully practicing from the 1980s up to present: S. Kazarnovsky's "Class Center", E. Yamburg's School, St. Alexis Desert of Father Peter (Vasilenko), Lyceum "Tekos" of M. Shchetinin, school-laboratory of V. Garmash, V. Shatalov's school. The leaders of these educational institutions are male teachers, as a rule, with extensive working experience, academic degrees, humanists and enthusiasts of their occupation of "making a difference in the world".

Judging by the documentary *A Lifelong Lesson* (2016), produced by the Ministry of Education and Science of Russia, a modern successful teacher should be active, enthusiastic, eager not only to teach, but also to learn, "to absorb what motivates his/her pupils", to love children and the teaching profession. This is what one of the main film characters is like, the winner of the competition "Teacher of the Year 2010" I. Khusainov, working at school is a way of life for him.

5. Conclusions

To conclude, in the Soviet cinema the image of the female teacher was transformed in the following sequence: the heroine-revolutionary (*Alone*, 1931), the heroine of labor (*The Village Teacher*, 1947), the intellectual (*Spring in Zarechnaya Street*, 1956), the innovator (*The Key That Shouldn't Be Handed On*, 1976), the victim (*Dear Elena Sergeevna*, 1988, *Homo Novus*, 1990, etc.), the bureaucrat-administrator (*Light in the Night*, 2004; *The Village Teacher*, 2009; *Uchilka/The Teacher*, 2015).

In the Soviet audio-visual texts of the 1930s-1940s, the heroic image of a teacher-fighter for revolutionary ideals (*Alone*, 1931) dominates, later on it gradually softens, acquires the aspect of labor heroics (*The Village Teacher*, 1947). Female teachers become good-looking, attractive (*The Village Teacher, First-grader*). Cinema of the Stalin era is characterized by the image of the woman teacher as an indisputable perfection, the embodiment of tranquility and justice.

The theme of motherhood for female teachers in Soviet / Russian cinema is either not raised at all, or is sublimated into maternal care as a quality characteristic of a woman in general, revealing the essence of the heroine, directed not at her own child but at her pupils (*The Village Teacher*). Often, teachers are childless women with a failed personal life (*We'll Live Till Monday*, *Other People's Letters*), single mothers (*The Key That Shouldn't Be Handed On*, 1976, *Homo Novus*, 1990), or mothers concealing their motherhood (*Light is the Night*, 2004).

The image of the male teacher was transformed in Soviet / Russian cinema in the following way: the ideological organizer of the labor commune (*Road to Life*, 1931); a teacher by vocation, an enthusiast (*The Teacher*, 1939); an intellectual-humanist (*We'll Live till Monday*, 1968, *Big Break*, 1972; *Diary of the Headmaster*, 1975); a loser under circumstances (*Fun of the Young*, 1987; *The Geographer Drank His Globe Away*, 2013); an idealist, an ascetic, a self-sacrificing teacher, first and foremost a professional (*Light is the Night*, 2004, *The Village Teacher*, 2009).

Soviet film industry was shaping a masculine image of a teacher for many years – the teacher as the creator of a new man worthy of living under Soviet rule (Sergeev in the film *Road to Life*, 1931; Sorokin in *The Republic of ShKID*, 1966). In "perestroika" and modern Russian period, images of male educators, who failed to find another application in life, that is, random people, not professionals (for example, Sluzhkin in *Geographer Drank His Globe Away*, 2013) began to appear more and more often on the screen.

For all that, it is with the male teacher that the theme of innovation is connected in feature and documentary films. Talented teacher Melnikov (*We'll Live till Monday*, 1968), a historian with a non-trivial approach to the presentation of material in the Soviet school of the 1970s was doomed to isolation. Around him is only "a narrow circle of initiates, because he is no longer given a good school on a large scale. He is still such a wandering twinkle in an absolute swamp" (Bykov, 2015). After half a century, little has changed. The images of modern teachers-innovators in Russian cinema are a rare exception to the rules (Tikhonov in the film *The Village Teacher*, 2009, headteachers *in Looking for a Teacher*) nevertheless they are in demand in society.

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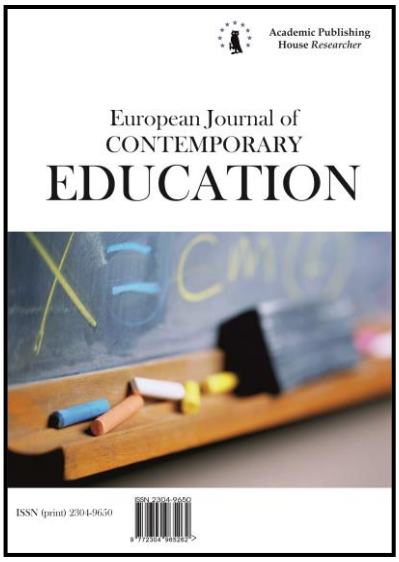

Enhancing of Self-Efficacy in Teacher Education Students

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Abstract

In this study, the effectiveness of training module on enhancing self-efficacy in teacher education students was investigated. Sixty-eight (68) teacher education students (*M* age = 22.74; *SD* = .57) participated in this study, 36 of whom were assigned to an experimental group and the other 32 were assigned to a control group. The training module on enhancing self-efficacy composed of 26 one-hour sessions was applied on experimental group. A pretest-posttest control group design was used in order to assess the effectiveness of the training module as well as to collect data. A General Self-efficacy Scale, a Social Self-efficacy Scale, and a Teacher Self-Efficacy Scale were used. The findings showed that this training module on enhancing social self-efficacy was effective on the teacher education students' general self-efficacy, social self-efficacy, and teacher self-efficacy beliefs.

Keywords: general self-efficacy, social self-efficacy, teacher self-efficacy, teacher education students.

1. Introduction

Purposeful training module on enhancing self-efficacy among teacher education students assists in encouraging the aforementioned processes of individualisation and socialisation. Some authors (Klassen, Tze, 2014; Velthuis et al., 2014) consider teacher education students' professional competence as one of the most important factors in educators training. A recent review of the teachers' self-efficacy literature (Klassen, Tze, 2014) revealed numerous cross-sectional studies, but only a few studies investigating change in teacher education students' self-efficacy over time or and under the influence of training module for enhancing self-efficacy. Teacher characteristics such as self-efficacy, content of training modules may be related to teaching outcomes (Wayne, Youngs, 2003). In the process of training, a teacher becomes more a consultant,

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however retaining the leading role in an educational system. In such case the role of social psychological training (for instance, training on enhancing self-efficacy) increases even more. The purpose of social psychological (e.g., training on enhancing self-efficacy) in post-modern society is named as formation of human being who would be able to adapt in the surrounding as much as possible and to master social competence (Staut, 2002).

Self-efficacy is defined as one's belief in one's ability to effectively direct one's actions to achieve the set goals and succeed in completing a specific task. Self-efficacy refers to a person's perceived capability, as distinct from functional ability, to perform a particular action or course of action. According to Bandura (1993) self-efficacy beliefs have a major role in changing behaviors, as these beliefs determine the decision making in performing a behavior, the effort spent, and the problems that arise throughout the process. Bandura (1993) pointed out that people with high self-efficacy tend to have greater cognitive resourcefulness, strategic flexibility, and effectiveness in managing their environment, and set motivating goals for themselves.

Self-efficacy is commonly understood to be domain-specific (Schwarzer & Hallum, 2008). That is, one can have more or less firm self-beliefs in different domains or particular situations of functioning. But there is also a general sense of self-efficacy that refers to global confidence in one's coping ability across a wide range of demanding or novel situations (Schwarzer & Hallum, 2008). General self-efficacy aims at a broad and stable sense of personal competence to deal effectively with a variety of stressful situations (Schwarzer, 1992). Teachers with high general self-efficacy choose to perform more challenging tasks (Schmitz & Schwarzer, 2000; Schwarzer & Hallum, 2008).

One aspect of self-efficacy little explored is social self-efficacy (Zullig et al., 2011). Social self-efficacy includes such skills as social boldness, participation in a social group or activity, friendly behaviors, and getting and giving help (Connolly, 1989). Social self-efficacy relates to individuals' ability to overcome social-oriented challenges and barriers (Muris, 2001). In our opinion, it is particularly relevant to investigate this phenomenon in the context of teacher education students' training because teaching is known to have a major role in personality's development.

Teacher self-efficacy is defined as 'the teacher's belief in his or her capability to organise and execute courses of action required to successfully accomplish a specific teaching task in a particular context' (Tschannen-Moran et al., 1998: 233). Teachers with a high level of self-efficacy believe that they can teach difficult students effectively (Baleghizadeh & Shakouri, 2017). Teacher self-efficacy is context specific and this should be considered while judging teachers' self-efficacy (Tschannen-Moran et al., 1998; Tschannen-Moran &Woolfolk-Hoy, 2001).

The number of studies focusing on self-efficacy of students and teachers as well as the aspects of enhancing self-efficacy has been increasing in the last years. The development of research in the said field was mostly influenced by the appearance of studies on the importance of general self-efficacy (Luszczynska et al., 2005), social self-efficacy (Erozkan, 2013), teacher self-efficacy (Schwarzer & Hallum, 2008; Yoon, 2002). Therefore, we consider that research is lacking the analysis of positive results of training module on enhancing self-efficacy even though we succeeded in finding several works of similar type (Moseley et al., 2002; Prieto & Meyers, 1999).

Study hypothesis – teacher education students will have more enhanced self-efficacy after training module than before it.

The aim of this study was to investigate the effectiveness of training module on enhancing self-efficacy in teacher education students. The following research question guided this study: what are the changes in self-efficacy between students after training module on enhancing self-efficacy?

The significance of research. This study is original because the majority of previous studies have focused on general or teacher self-efficacy among teachers, however there is still a lack of publications that would analyze general, social, and teacher self-efficacy in its entirety. Other studies in this topic concentrated only on changes of self-efficacy among teachers or teaching assistants when applying educational program for enhancing social self-efficacy (Moseley et al., 2002; Prieto & Meyers, 1999) but in this study changes of general, social, and teacher self-efficacy when applying training module on enhancing social self-efficacy in teacher education students were analyzed. Therefore, this study provides new knowledge of the enhancing self-efficacy in the field of research.

2. Research methods

Instruments. The Generalized Self-Efficacy Scale (GSE, Schwarzer & Jerusalem, 1995) is comprised of ten statements. Each of the statements may be graded on a scale from 1 to 4 points. The respondent chooses one of the statements which seems most suitable to him/her (always – 4, sometimes – 3, very rarely – 2, never– 1). The respondent may receive the minimum of 10 points. The maximum possible amount of points equals 40. The general self-efficacy level is considered to be low when the collected points range from 10 to 20, medium in case of 21–30 collected points, and high if the respondent got between 31 and 40 points. High level of self-efficacy is related to a superior mental and physical health, better luck and improved social integration. The scale has positive correlation with self-respect and optimistic attitude and a negative one with personal and situational anxiety, timidity and pessimistic outlook. The internal consistency of the questionnaire was assessed based on the Cronbach's alpha. The high validity and reliability of the scale has been demonstrated in many studies across various research contexts and various populations (Luszczynska et al., 2005). The value of the Cronbach's alpha coefficient for this sample was 0.74.

Social Self-efficacy Subscale (SSES). We measured social self-efficacy using six-items from the scale developed by Sherer *et al.* (1982), to evaluate the belief of individuals in their own social competence. The *SSES* items are rated on a 5-point Likert type scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). A high score for the subscale indicates strong social self-efficacy**.** In Sherer *et al.* (1982), *SSES*' coefficient alpha was .71. The Lithuanian version of the *SSES* shows internal consistency value .82 and a test-retest reliability coefficient of .84 for the present sample (Malinauskas, Brusokas, 2013). The value of the Cronbach's alpha coefficient for this sample was 0.77.

Teacher Self-Efficacy. For measuring the beliefs that students have on the control of their own teaching skills, the Teacher Self-Efficacy Questionnaire (TSEQ, Schwarzer, Schmitz & Daytner, 1999). The scale is comprised of 10 items that evaluate one's perceived major teaching skills on four dimensions: accomplishing professional tasks, developing skills on the job, social interaction with students, parents and colleagues and the stress versus coping mechanisms associated with teaching. The items are personal, using the word "I" and the concept I "be able to." good fit to teacher education students. The authors of the scale focused on difficult tasks, reasoning along with Bandura's theory that to ask about easy tasks would not be getting at self-efficacy. The answers are scored on a 4-point Likert scale (1 – not at all true, 2 – barely true, 3 – moderately true, 4 - exactly true), the TSEQ having a .76 test-retest fidelity and a Cronbach's alpha ranging from .76 to .82 (Schwarzer et al., 1999). The value of the Cronbach's alpha coefficient for this sample was 0.73.

*Research Design and Procedure***.** In the research, pretest-posttest control group quasi-experimental design was used. Such design was chosen because true experimental design can encumber educational activities due to the random selection into groups. Quasi-experimental designs in which random selection is not required are frequently used designs in educational researches and guidance and psychological counseling studies (Sağkal et al., 2012). Since in this study, the assignment of students who have chosen free chosen module for enhancing self-efficacy to new groups is not possible, a quasi-experimental design was used. Training module for enhancing social self-efficacy composed of sixty four 26-one-hour sessions (two sessions per week) was applied on experimental group. On the other hand, control group has not been provided any treatment.

Statistical Analysis. Research data were statistically processed using *SPSS 22.0* (*Statistical Package for Social Sciences*). Descriptive statistics, namely means, standard deviations, were calculated. Skewness (the symmetry of a distribution) and kurtosis (the homogeneity of a distribution) coefficients were calculated to assess univariate normality because Student *t* test requires normally distributed data. Skewness and kurtosis coefficients between +1 and -1 indicated that data were normally distributed. We calculated the reliability of each dimension given by the index of Cronbach's alpha internal consistence. A preliminary analysis used the Student *t* test for independent samples, comparing the experimental group with the control group with the aim of checking whether the two groups were homogeneous. Then, the Student *t* test for dependent samples, comparing the experimental group before experiment and after it and the control group before experiment and after it, was used in order to analyse the effects of the training module. Considering the recommendation of Arnau and Bond (2008), repeated measures (RM) multivariate analysis of variance (2 × 2 (Group × Time) MANOVA) was used in order to analyse the

effects of the educational program. Wilks's lambda was used to evaluate all multivariate effects; the significance level was set at .05. Effect sizes for *F*-statistics were expressed as partial eta-squared (η_p^2). According to Tabachnick and Fidell (2007) effect size based on η_p^2 = .01 corresponds to a small effect, η_p^2= .09 corresponds to a medium effect, and η_p^2= .25 represents a large effect.

Sample and Procedure. Participants were 68 teacher education students (*M* age = 22.74; *SD* = .57) participated in this study, 36 of whom were assigned to an experimental group (they have chosen module on enhancing and the other 32 were assigned to a control group). There were no significant differences between the experimental and the control groups by age (p > .05) and gender (p > .05). Both tested groups consisted of students attending Lithuanian Sports University. Table 1 shows the training module on enhancing social self-efficacy in teacher education students.

Table 1. Content of training module on enhancing self-efficacy for teacher education students

№.	Enhanced self-efficacy dimensions	Training sessions	Descriptions of training sessions
1.	General self-efficacy	Emotional Communication	Students are encouraged to use relationship-building communication skills (e.g., active listening); helping to other students identify and appropriately express emotions
2.	Social self-efficacy	Promoting Social Skills	Group members will attempt to share and cooperate, use good manners, and get along with peers
3.	Teacher self-efficacy	Discipline and Behavior Management	Students are encouraged to give clear and developmentally-appropriate directions; setting limits and rules; stating behavioral expectations and consequences

The followed stages of training were used on enhancing self-efficacy for teacher education students: 1) *presentation of a skill*; 2) *practice*; 3) *feedback*; 4) *reinforcement of a skill*.

Presentation of a skill – during this stage of training educator provides examples of educated social skills.

Practice – once students acquire a new skill, they need to be able to use the skill proficiently or fluently. The educator provides multiple opportunities for them to practice and master this skill, as well as prompt students to use their new skills in new situations.

Feedback – it is providing information about how successful a student was applying a new skill in a simulated situation, emphasizing how much his/her behaviour coincided with the model's behaviour. In this stage of training it is particularly important to provide positive social incentive – evaluation, praise.

Reinforcement of a skill – when students apply their new skills to new situations, people, activities, and settings they demonstrate generalized use of these skills. For instance, student might train a new skill during training session and then generalize that skill by using it at different setting.

Several methods have been used to enhance teacher education students' self-efficacy: *demonstration, social role performance, case analysis of the situation, small groups, and group discussions*.

3. Results

Student's *t* test for independent samples showed that the experimental and the control group before the training module did not differ significantly in general self-efficacy (t (66) = -1.38; p = .17), social self-efficacy (t (66) = -1.89; p = .06), and teacher self-efficacy (t (66) = -1.88; p = .07).

Overall RM MANOVA results showed significant effect of the training module on enhancing self-efficacy in teacher education students, i.e. the influence of group by time interaction was significant (Wilks Lambda = .85; F (3,64) = 3.76; p = .015; η_p^2 = .15).

Univariate tests of RM MANOVA confirmed effects of the training module on enhancing self-efficacy. After the end of the training module experimental group students demonstrated statistically significant improvement of general self-efficacy (F (1,66) = 6.49; p < .05; η_p^2 = .09), of social self-efficacy (F (1,66) = 6.74; p < .05; η_p^2 = .09), and teacher self-efficacy (F (1,66) = 9.25; p < .01; η_p^2 = .12). All of these significant changes demonstrate the impact of the training module on enhancing self-efficacy in teacher education students. The results are summarised in Table 2.

Table 2. Self-efficacy dimensions among teacher education students (M±SD)

Self-efficacy	Experimental group		Control group		Univariate tests of RM MANOVA Group × Time		
	Before experiment	After experiment	Before experiment	After experiment	F	p	η_p^2
General self-efficacy	3.35 ± 0.21	3.56 ± 0.15	3.45 ± 0.36	3.39 ± 0.25	6.49	.013	.09
Social self-efficacy	3.31 ± 0.27	3.55 ± 0.19	3.46 ± 0.38	3.40 ± 0.30	6.74	.012	.09
Teacher self-efficacy	3.33 ± 0.25	3.56 ± 0.21	3.46 ± 0.35	3.36 ± 0.33	9.25	.003	.12

Notes. (M ± SD) – mean and standard deviation; η_p^2 – effect size.

Analysis of the results of experimental and control groups after the experiment showed statistically significant improvement of general self-efficacy ((t(66) = 3.48, p < .01, Cohen's d = .82), social self-efficacy ((t(66) = 2.59, p < .05, Cohen's d = .60), and teacher self-efficacy ((t(66) = 3.14, p < .01, Cohen's d = .72) in the experimental group.

4. Discussion

The purpose of the present study was to investigate the effectiveness of training module on enhancing self-efficacy in teacher education students. The main factor determining the validity of the present research was that during an initial research conducted before the experiment, the experimental group and the control group were not statistically different according to the self-efficacy indicators. The present study supported the effectiveness of training module on enhancing self-efficacy.

Analyses indicated that the training module was effective in changing self-efficacy dimensions (general self-efficacy, social self-efficacy, and teacher self-efficacy) of the experimental group of participants. The effect sizes for most observed differences due to treatment were in the medium range from η_p^2 = .09 to η_p^2 = .12. It was established that all self-efficacy indicators in the experimental group after the enhancement of self-efficacy were higher in comparison with those of the experimental group before the educational experiment.

The hypothesis, that teacher education students' self-efficacy is significantly higher after training module than before it, was supported by the results of this study. This finding also was consistent with previous research that identified that educational programs have positive effect on improvement of self-efficacy (Chao et al., 2016; Mishal, 2016), where also a medium effect size was recorded. The present research data may be explained by the self-efficacy theory (Bandura, 1993), which emphasises that methods for enhancing (building, maintaining, regaining) social self-efficacy based on the information from the four major self-efficacy sources (i.e., mastery experiences, vicarious learning, verbal persuasion, and psychological arousal). The results of the present study add to the argument of Pinar and Sucuoglu (2013), those who indicated that the most effective teaching techniques are modeling, rehearsing, and rewarding, and among these techniques, modeling is the most important. It can be explained by the argument that with modeling, teaching education students not only observe the correct/appropriate skills, but that

they also have the opportunity to implement the desired behavior without fear of being excluded and making mistakes.

In conclusion, our finding that teaching education students of the experimental group after training module had improved self-efficacy more than the same students before experiment might be explained by Thompson and Schlehofer (2011). They stated that people have a sense of perceived controllability when they believe that, in general, personal action controls outcomes and they personally have the skills to enact those actions (self-efficacy).

Our results limited to teaching education students. This analysis did not cover students of other study programs, and as a result, the conclusions cover only the changes in self-efficacy before training module on enhancing social self-efficacy and after it in teaching education students. The present study indicates that further researches are necessary to reveal how long after the training module teaching education students have to preserve self-efficacy beliefs improved during the training module.

5. Conclusion

Statistical analyses revealed that training module on enhancing social self-efficacy was effective on the teacher education students' general self-efficacy, social self-efficacy, and teacher self-efficacy beliefs.

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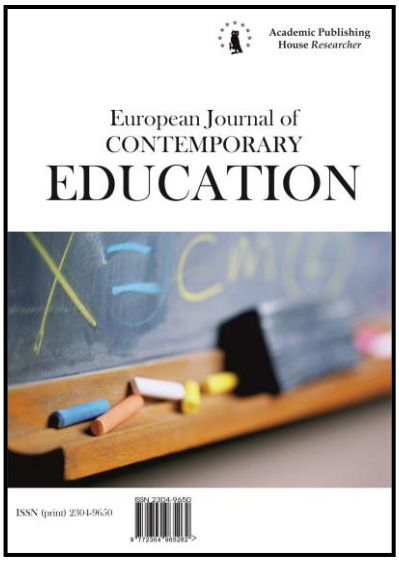

Assimilation and Forgetting of the Educational Information: Results of Imitating Modelling

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Abstract

Various approaches to the problem of computer modelling of assimilation and forgetting of the educational information are considered. With the help of the multi-component model the Ebbinghaus' curve of forgetting of poorly assimilating information to be remembered through recurrences is confirmed. It is taken into account, that while training there is a transition of weak (poor) knowledge into strong (firm) knowledge, and while forgetting – the return transition of strong knowledge into weak knowledge. Also the model of assimilation and forgetting of the educational material with a high links degree, consisting of information blocks which contain the connected concepts is created. It allows to explain that: 1) while training there is the sharp increase of the understanding level of the studied problem; 2) after termination (ending) of training during some time the level of the pupil's knowledge remains high, and then slowly lowers because of gradual forgetting of the separate learning material elements. The paper shows that the processes of assimilation and forgetting occur according to the logistic law. Along with that the imitating model of training at school which takes into account the knowledge division into three categories and distribution of the educational information on classes is offered. For all cases there are graphs of the knowledge level dependence on time.

Keywords: didactics, training, learning, forgetting, computer modelling, level of knowledge, information block, Ebbinghaus' law.

1. Introduction

The learning efficiency strongly depends on the pupil's perception, understanding, memorizing and forgetting of the reported information (Velichkovskij, 2006). The regularities of these processes are studied by experimental psychology (Zinchenko, 2002). The fundamental

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research in this area is the work by Ebbinghaus (1885), devoted to the study of laws of storing (memorizing) without participation of the thinking processes, in which the method of learning senseless syllables exciting no semantic associations was used. It is impossible to name knowledge received by the pupil at a lesson, as the senseless information; it is easily associated with concepts, laws and theories, which the schoolchild has got already. S.L. Rubinstein marks, that forgetting of the comprehended material is not described by the Ebbinghaus's curve (fig. 1.1); this process submits to different laws and happens considerably slower (Zinchenko, 2002, p. 136).

In our opinion, each information block and each pupil can be described by some latent parameter K_S which can be named as a linking degree. It characterizes the swiftness and lightness of the logic or associative links occurrence with knowledge, which the schoolchild already has. It is the knowledge linking degree, lesson duration and the teaching technique that the durability (strength) of the pupil's knowledge depends on. The purpose of the paper is creation and substantiation of the model of assimilation and forgetting of the learning material with a certain link coefficient, which includes: 1) the separate learning material elements (LMEs), untied with other concepts and remembered mechanically; 2) the logically and/or associatively connected information consisting of reasonings (ideas, theorem proofs, solving of the equations, etc.), which are acquired by means of their inclusion into the pupil's system of concepts. On the basis of the received results it is planned to create a model of training at school.

2. Research methods

The research uses the method of qualitative modelling, the mathematical and computer simulation methods. The qualitative model of the assimilation and forgetting is constructed and after this the transition to mathematical model which is system of the differential equations occurs. For the numerical solution of the differential equations the Euler's method is used. For modelling of assimilation and forgetting of the comprehended information the computer program recalculates a matrix of probabilities, increasing or reducing its elements, simulates "testing of the pupil" etc. The offered simulation models of assimilation and forgetting is based on the works by R. Atkinson, G. Bauer and E. Kroters (Atkinson et al., 1969), R. Bush and T. Mosteller (Bush, Mosteller, 1962), D. Gibson and P. Jakl (Gibson, Jakl, 2013), L.P. Leont'ev and O.G. Gohman (Leont'ev, Gohman, 1984), V.V. Mayer (Razumovskij, Mayer, 2004), F.S. Roberts (Roberts, 1976), A.P. Sviridov (Sviridov, 2009), Hunt E. (Hunt, 2007), and is the development of the approach stated in the works by R.V. Mayer (Mayer, 2014; Mayer, 2015; Mayer, 2016).

3. Discussion

The model should reflect the most important aspects of researched object, neglecting the minor ones. In case of modeling of didactic process the following purposes are usually pursued: 1) studying of an essence of that or other didactic object, process, component elements and links between them; 2) explanations of the known facts established by a method of the pedagogical observation and experiment; 3) forecasting of the didactic system behaviour in new conditions with various external influences and ways of management; 4) optimizations of functioning of the didactic system, search of the correct management according to the chosen criterion of an optimality. In dependence of the randomness degree of the simulated process we can distinguish: 1) the determined models, in which the random factors are not taken into account, and the changes of system state are depend only on its internal condition and external influence at the current moment of time; 2) stochastic models which work similarly to probabilistic automatic devices; their internal states and the reactions on an output at the following moment of time are set by a matrix of probabilities. The mathematical models are forming a wide class of abstract models, in which the logic conditions, algebraic or differential equations and random variables are used (Atkinson et al., 1969). To study the mathematical model, an analytical or numerical method (that is, with the computer help) is used. The computer (or imitating) models are an algorithm or computer program simulating the behaviour of the researched system "teacher – pupil" (Gibson, Jakl, 2013). Thus the methods of the numerical solving of the differential equations system, the automatic approach or multi-agent method are applied. Various aspects of the modeling problem of didactic systems are considered *in the book "Cybernetic pedagogics: Imitating modelling of training process" (Mayer, 2014), and also in articles (Mayer, 2015, Mayer, 2016).*

4. Multi-component model of training and the Ebbinghaus's curve

The model of learning of the poorly-associated information should correspond to the follows facts: 1) right after the end of short training the schoolchild's knowledge decreases quickly (fig. 1.1), then slower, and at $t \to \infty$ it remain constant (20-25 % from the studied material); 2) after long or repeated training the pupil firmly acquires the reported to him information; the forgetting speed is low.

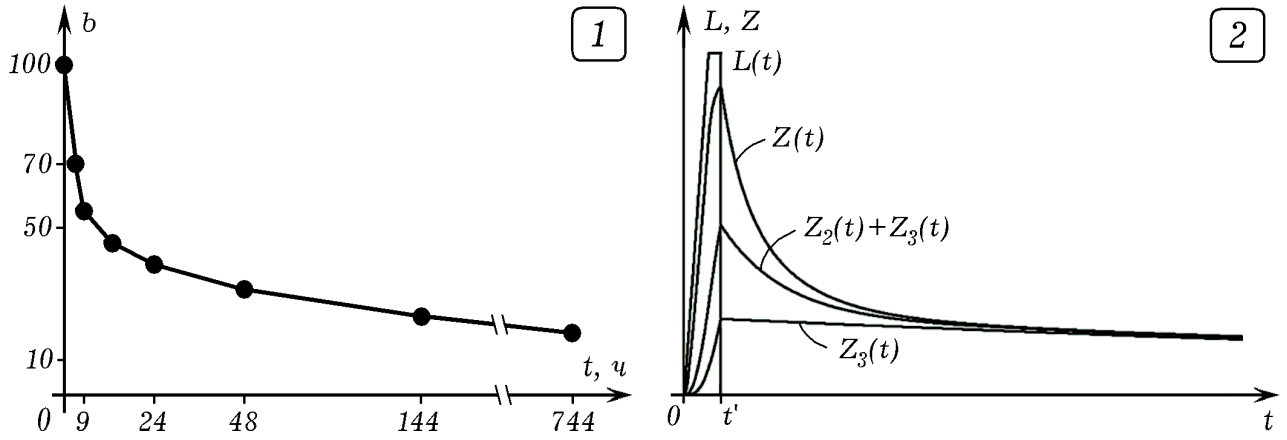

Fig. 1. The Ebbinghaus's curve (Zinchenko, 2002) and results of the simulation.

The described regularities of assimilation and forgetting is in agreement with three-component model of training, which is expressed by the system of four equations (while training $k = 1$, otherwise $k = 0$):

$$dZ_1/dt = k(\alpha(L - Z) - \alpha_1 Z_1) - \gamma_1 Z_1 + \gamma_2 Z_2,$$
$$dZ_2/dt = k(\alpha_1 Z_1 - \alpha_2 Z_2) - \gamma_2 Z_2 + \gamma_3 Z_2,$$
$$dZ_3/dt = k\alpha_2 Z_2 - \gamma_3 Z_3, \quad Z = Z_1 + Z_2 + Z_3,$$
$$\alpha = 0{,}1; \ \alpha_1 = \alpha_2 = 0{,}015; \ \gamma_1 = 0{,}027; \ \gamma_2 = 0{,}009; \ \gamma_3 = 9 \cdot 10^{-5}.$$

The model takes into account that: 1) the pupil's total knowledge Z is divided into the weak knowledge Z_1 (Kn–1), the average strength (or durability) knowledge Z_2 (Kn–2), the strong knowledge Z_3 (Kn–3) with forgetting coefficient $\gamma_1 > \gamma_2 > \gamma_3$; 2) the speed of the weak knowledge increase is equal $\alpha(L - Z)$, where L – the level of the teacher's requirements, Z – the total knowledge; 3) while training ($k = 1$) the weak knowledge partially turns into the strong knowledge; 4) with no training ($k = 0$) the strong knowledge partially becomes weak, and the weak knowledge is forgotten. For the solution of this system of equations the computer program containing the time cycle is used. It calculates and accumulates the increases of knowledge ΔZ_k ($k = 1, 2, 3$), corresponding to the given temporary step, and draws the graphs $Z_1(t)$, $Z_2(t)$ and $Z_3(t)$.

Let us take that during time t_1 the pupil tries to remember N learning material elements (LMEs) mechanically (for example, 30 foreign words) and uses the recurrence method. At first he tries to remember the first LME, then – the second LME, without forgetting the first LME, etc. At the end of training he should keep in memory all N LMEs. Thus the level of the schoolchild's requirements to his knowledge, grows with constant speed. Having once revised all LMEs within time t_1, during time $t_2 = t' - t_1$ the schoolchild repeats it again and again, trying to keep in memory all N LMEs. At this interval of time the level of the requirements L remains constant. Here training comes to an end ($t > t'$, $L = 0$), and forgetting begins. Fig. 1.2 shows the graphs which are the result of computer solution of the considered equations system. Under the given parameters of the model, about one fourth part of the studied information is remembered strongly and after the termination of training its quantity decreases very slowly. All other acquired knowledge is forgotten rather quickly. The graph $Z(t)$ on fig. 1.2 is very similar to the Ebbinghaus' curve (fig. 1.1).

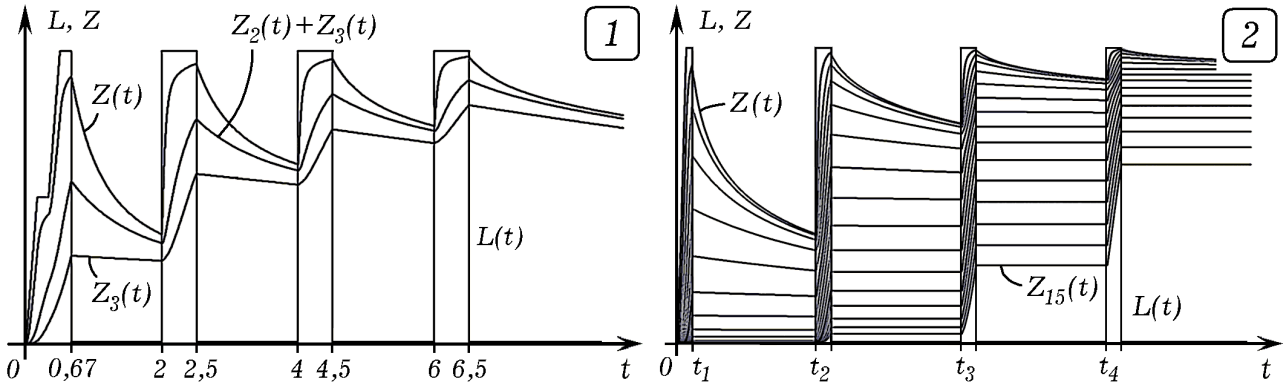

Fig. 2. The results of modelling: a) $N = 3$; b) $N = 15$.

Let us model the pupil, who studies some material within 40 minutes (0,67 hour), and then he repeats it several times. Let us take that on the first lesson he tries to remember the first half of some text, then he revises it, and then he tries to remember the second half of text and then he repeats the whole text. After that a break follows, and at the moment of time $t = 2$ hours the second lesson of 30 minutes (0,5 hours) begins, at which the schoolchild tries to learn the text again. The third and fourth lessons begin at the moment of 4 and 6 hours, their duration is 0,5 hours. The turning out curves which show the changes of the pupil's knowledge of various strength, are presented in the fig. 2.1. It is visible that after each lesson the quantity of knowledge Kn–1, Kn–2 and Kn–3 grows and in breaks between them – decreases. If the lesson duration increases, then the strength of the acquired knowledge grows.

Generalizing the considered above three-component model, we come to the following N–component model of training (system of $N + 1$ equations):

$$dZ_1/dt = k(\alpha_0(L - Z) - \alpha Z_1) - \gamma_1 Z_1 + \gamma_2 Z_2,$$
$$dZ_i/dt = k\alpha(Z_{i-1} - Z_i) - \gamma_i Z_i + \gamma_{i+1} Z_{i+1}, \quad i = 2, 3, \ldots, (N - 1),$$
$$dZ_N/dt = k\alpha Z_{N-1} - \gamma_N Z_N, \quad Z = Z_1 + Z_2 + \ldots + Z_N,$$
$$\alpha_0 = 0{,}1; \ \alpha = 0{,}05; \ \gamma_1 = 0{,}03; \ \gamma_{i+1} = \frac{\gamma_i}{2{,}72}; \ i = 2, 3, \ldots, N.$$

Here Z_1 – the quantity of the schoolchild's weakest knowledge, which are forgotten very quickly; Z_N – quantity of the strongest knowledge; αZ_1 – the transformation speed of the knowledge Kn–1 into the knowledge Kn–2. For the numerical solution of the equations system at $N = 15$ a special computer program is used. The results of modelling (fig. 2.2) correspond to real change of the pupil's knowledge rather well.

5. Constructing of a matrix model of the logically connected information learning

Now we consider a situation, in which the schoolchild acquires the logically connected information, for example, the conclusion of the formula, the proof of the theorem, a system of reasonings, etc. The mastering and forgetting of the logically connected educational material occurs according to the following regularities: 1) during training there is a fast qualitative growth of knowledge as a result of which the pupil suddenly begins understanding the material being studied; 2) often the pupil is not able to recall the specific learning material element (LME) directly, but he can recall it by association or logically deduce it from the LMEs known to him; 3) after the end of training if the pupil does not use the received knowledge, the reverse leap occurs: the comprehension level of the studied problem remains high at first, and then decreases.

While studying the logically connected material the pupil not only tries to remember a set of separate LMEs (concepts, formulas), he tries to acquire the sequence of reasonings. The important condition of fast and strong assimilation of the reported information is its understanding, that is inclusion of any new facts, ideas and theories into the system of knowledge and representations which the pupil has, making connections with the acquired information (Zinchenko, 2002). The essence of the offered approach is, that the educational material is considered as a set of N separate ideas or information blocks. Each block consists of M learning material elements (LMEs),

ordered and connected with logic links. To understand any new idea the pupil should solve the given intellectual problem, that is to study a sequence of all LMEs, included into the given information block, in first time. When the schoolchild has acquired all LMEs of the given idea and, solving the educational task, again goes through their sequence, in second (fifth or tenth) time he turn to the concrete cognitive situation. This happens without active involvement of thinking and is called understanding-recollection.

Knowledge of the given (i,j)–LME is defined by probability $p_{i,j}$ of the correct answer to the corresponding elementary question (fig. 3). The probability of the specific idea reproduction by the pupil is equal to the product of the all LMEs reproduction probabilities making this idea. Each LME is connected to some LMEs from some other ideas (blocks). For the simplicity, it is possible to imagine a two-dimensional matrix of N lines and the M columns in which each element corresponds to probability $p_{i,j}$ of the corresponding LME remembering and is connected with nearby LMEs (fig. 3). The links degree is defined by coefficients $c_{i,j}$.

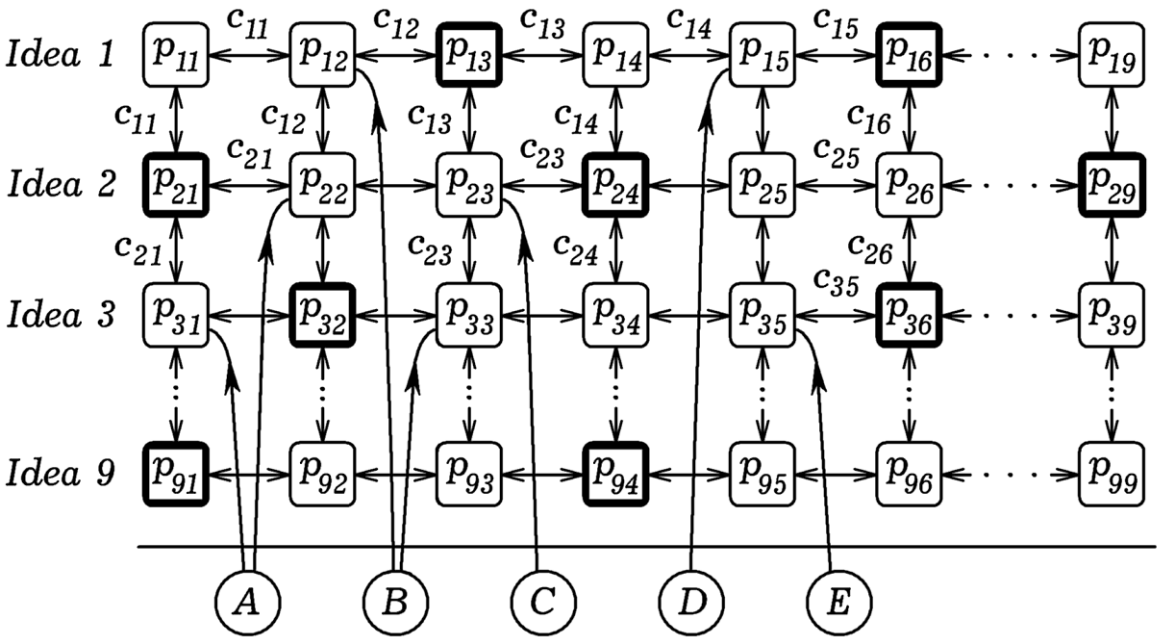

Fig. 3. The comprehended information as a system of N chains of the L LMEs.

We characterize the studied material by: 1) the amount of the ideas (LMEs chains); 2) the average length of ideas L; 3) the proportion D of LMEs known to the pupil a priori, that is before training; 4) the average coefficient of assimilation a. All LMEs can be divided into two categories: 1) well-known to the pupil; the probability of the correct answer for them is $p_{i,j} = 1$; 2) poorly-known to the pupil before the beginning of training, $p_{i,j} = 0 - 0{,}1$. Fig. 3 shows the first, second, third and ninth information blocks; LMEs of the first category (which are well-known to the pupil before training) are bold-framed. Each LME is connected with other LMEs (coefficient $c_{i,j}$ of some links can be equal to 0), and also with LMEs A, B, C, D, E which don't enter into structure of these logical reasoning chains. These links with external LMEs lead to increase in the assimilation coefficient $a_{i,j}$ of the given LME. We can take into account this fact, choosing $a_{i,j}$ from some interval in a random way.

Let us represent the poorly acquired LMEs ($p_{i,j} < 0{,}33$) in dark blue color, well acquired LMEs ($p_{i,j} > 0{,}67$) – in red, and all other LMEs – in green color (fig. 4). While training the average value p for all LMEs grows, blue sections turn into green, and green sections – into red. The more red and green sections in the line (information block), the higher the probability that the pupil has acquired this information block and will manage to do the corresponding sequence of reasonings. The more ideas the pupil has acquired, the bigger the probability of reproduction of all training material.

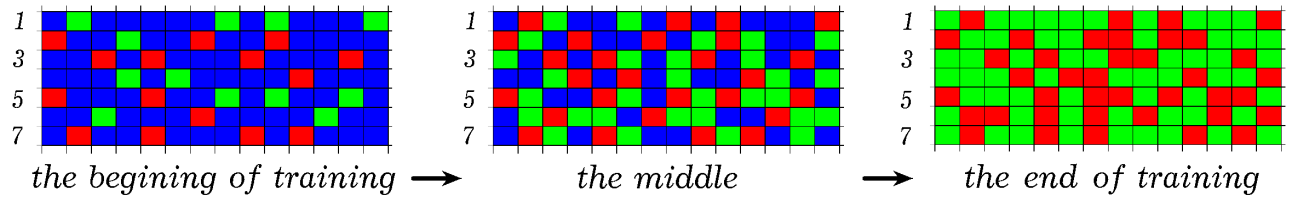

Fig. 4. Changes of the LMEs matrix while training.

It is important that the knowledge of one LME leads to easier assimilation and remembering of an other related LMEs. While training probabilities $p_{i,j}$ and the link coefficients $c_{i,j}$ increase: the pupil reproduces all sequence of reasonings (all information block) easily. To consider the fact that some LMEs are well-known to the pupil before training, the matrix $d_{i,j}$ is created where elements with the given probability D are equal to 1, and with probability $(1 - D)$ – to zero. Let us take that while training the pupil carry out the sequence of the same educational tasks, consistently reproducing the idea after the idea, LME after another LME. It is known that while studying any logically connected material, the knowledge of one LME helps the pupil to study or recollect knowledge of another related LME. When studying j-th LME from the i-th idea within time Δt, the probability of the correct pupil's answer to the corresponding elementary question according to the law:

$$p_{ij}^{k+1} = p_{ij}^{k} + a\left(1 - p_{ij}^{k}\right)\Delta t + c_{i,j}\left(p_{i-1,j}^{k} + p_{i+1,j}^{k} + p_{i,j-1}^{k} + p_{i,j+1}^{k}\right)\Delta t.$$

Here $c_{i,j}$ is the coefficient of links allowing to note influence of other LMEs on assimilation of (i,j)–LME, k – the step number. For simplicity sake we consider all link coefficients identical and constant. The model considers that in the process of the knowledge level growing the pupil's operating time with (i,j)–LME decreases, aspiring to Δt. If at the given moment the pupil doesn't operate with (i,j)–LME, then owing to forgetting the knowledge of this LME within time Δt decreases according to the exponential law. The average value of probabilities $p_{i,j}$ for all LMEs in moment t is labeled as $p(t)$.

For an estimation of the pupil's knowledge and making the graph $Z(t)$ it is necessary to simulate the repeated periodic "testing" of the pupil at regular intervals. The pupil's knowledge of the i-th idea is determined as follows. The computer simulates the pupil's answer, in which he consecutively states the first LME, the second LME..., the L-th LME of the i-th chain (information block) during the given time.

The correct answer to the question corresponding the j-th LME from the i-th idea, is simulated as a casual process occurring to the probability $p_{i,j}$: the random variable x from the interval [0,1] is generated and the condition $x < p_{ij}^{k} + c(p_{i-1,j}^{k} + p_{i+1,j}^{k} + p_{i,j-1}^{k} + p_{i,j+1}^{k})$ is checked. If the condition is true, it is considered, that the pupil has answered correctly, and if it is false – not correctly. In case of the wrong answer the pupil tries to reproduce the (i,j)-LME again, and in the case of the correct – he passes to the next LME from the same idea. If all L LMEs of the i-th chain are done correctly within the answering time $\tau = 1{,}3L\Delta t$, it is considered, that the schoolchild knows the i-th information block. The pupil's knowledge quantity $Z(t)$ is equal to the number of ideas (information blocks), which he can reproduce. At such "testing" the schoolchild's knowledge does not increase, the probabilities $p_{i,j}$ remain constant. For this modelling the program in Free Pascal is used.

Let us take that before training 10 % of all LMEs are known to the pupil, that is $D = 0{,}1$, their level of knowledge is $q = const$. The fig. 5 shows the results of modelling of assimilation and forgetting of the logically connected information in two cases: 1) there are no connections between LMEs (with $c = 0$, $a = 1{,}6$); 2) LMEs are connected with each other ($0 < c < 1$, $a = 0{,}4$). From results of modelling it follows: 1) even with no connections between LMEs the training leads to smooth increasing of $p_{i,j}$, that causes sharp rise of understanding $Z(t)$ educational material; 2) presence of connections with constant link coefficient c raises the probability of reproduction of the learned material by the pupil; the graph $p(t)$ bends in the other way, the advance $Z(t)$ is greater; 3) after the termination of training the average level of mastering of studied LMEs decreases according to an exponential law, but the knowledge level of the educational material at first

practically does not decrease, then quickly reduces. If to take into account, that while training the connection coefficient $c_{i,j}$ grows, the transition from ignorance to knowledge is be sharper.

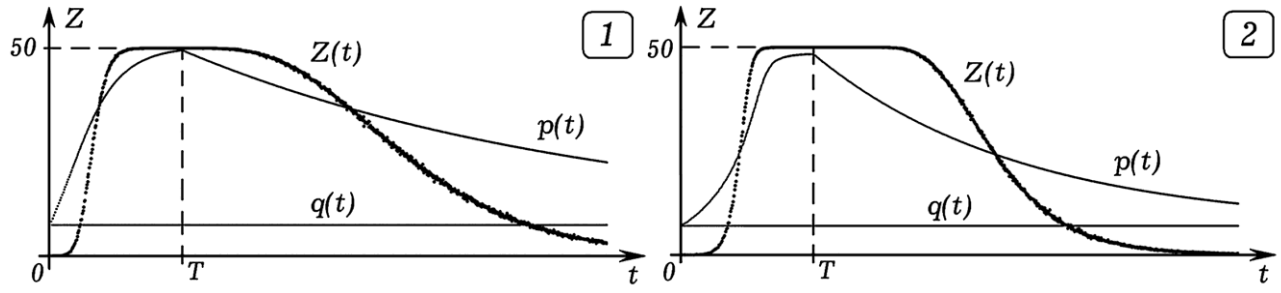

Fig. 5. The results of computer modelling of assimilation and forgetting.

The sharp rise of understanding is caused by the fact that the training material consists of the ideas (or information blocks), each of which contains the L number of LMEs. To reproduce the concrete idea, the pupil has to acquire all LMEs entering it; to acquire all training material he should learn to reproduce all ideas. Joint studying of LMEs, included in the given information block, leads to sharp increase in probability of its reproduction. Increase in the link degree between various LMEs promotes their easier storing (memorizing) and reproduction. Assimilation and forgetting of the logical connected information can be described by the logistic law: 1) assimilation: $dZ/dt = \alpha(I_0 - Z)Z$, where I_0 – the number of information blocks in educational material; 2) forgetting: $B = Z^0/100,\ x^0 = 100,\ dx/dt = -\gamma(100{,}5 - x)x, Z(t) = B \cdot x(t)$.

6. Computer modelling of school training

The proved regularities can be used for creation of the imitating model of training at 11-year school. The construction of model requires drawing up of system of the differential equations with their subsequent decision with help of the computer. The computer model will correspond to real process of training more precisely, if we take into account that strength and durability of acquiring of various topics are not the same. Therefore all LMEs should be divided into some categories, which the pupil forgets with different speeds. Let us select the following three categories: 1) the knowledge D used in the further activity and remembered very strongly; 2) the knowledge T of various theories, ideas, laws, reasonings, which are well associated with the concepts already known to the pupil, but not used in practice; 3) the abstract knowledge A of separate facts which are not used in further life and poorly associated with the concepts already known to the schoolchild. It is possible to assign the distribution of the educational information during all time of training at school (11 years) with help of three matrixes: 1) the quantity of the learning information in each class I_i =(30, 35, 40, 50, 65, 80, 100, 120, 145, 170, 175); 2) the share of the strong D–knowledge d_{1i} =(0,65; 0,6; 0,55; 0,5; 0,45; 0,4; 0,35; 0,3; 0,25; 0,2; 0,1); 3) the share of the weak A–knowledge d_{3i} = (0,05; 0,1; 0,1; 0,15; 0,2; 0,25; 0,25; 0,3; 0,3; 0,3; 0,3). Then the speed of the teacher's transfer and speed of the schoolchild's mastering of the knowledge of the first, second and third categories are equal: $v_{1i} = d_{1i}I/T, v_{2i} = (1 - d_{1i} - d_{3i})I/T, v_{3i} = d_{3i}I/T$.

When training the quantity of the pupil's knowledge for the corresponding class grows proportionally to the time: $Z(t) = Z_0 + v(t - t_0)$. Meanwhile all other knowledge decreases because of forgetting. The forgetting speeds of knowledge of the first and third categories are proportional to their quantity. The logically linked knowledge of the second category decreases according to the logistic law which has been mentioned above.

The offered mathematical model of training looks as follows:

$\frac{dD_i}{dt} = kv_{1i} - (1 - k)\gamma_1 D_i,$

$B = T_i^0/100,\ \ x_i^0 = 100,\ \ \frac{dx_i}{dt} = -\gamma_2(100{,}5 - x_i)x_i,$

$\frac{dT_i}{dt} = kv_{2i} + (1 - k)Bx_i(t),\ \ \frac{dA_i}{dt} = kv_{3i} - (1 - k)\gamma_3 A_i.$

When training in the j–th class the information acquired in 1, 2,..., $(j - 1)$ classes is forgotten; therefore if $i = j$, then то $k = 1$, but otherwise – $k = 0$. To find the pupil's total knowledge $Z(t)$ in

the given moment of time t it is necessary to summarize knowledge D_i, T_i and A_i in all classes ($i = 1,2,\ldots,11$).

In imitating modelling there is a problem of a successful choice of the numerous parameters of the model. As it is marked by R. Shennon, many parameters of the computer model are frequently determined on the basis of the expert's assumptions who analyzes rather small amount of the data (Shannon, 1975). Along with this the behaviour of the model should correspond to a real situation greatly. In our case the parameters of the model of the pupil ($\gamma_1 = 5 \cdot 10^{-3}$, $\gamma_2 = 7 \cdot 10^{-3}$, $\gamma_3 = 10^{-4}$) are selected so that the results correspond to training of the schoolchild, who successfully (that is for 70–80%) copes with the curriculum.

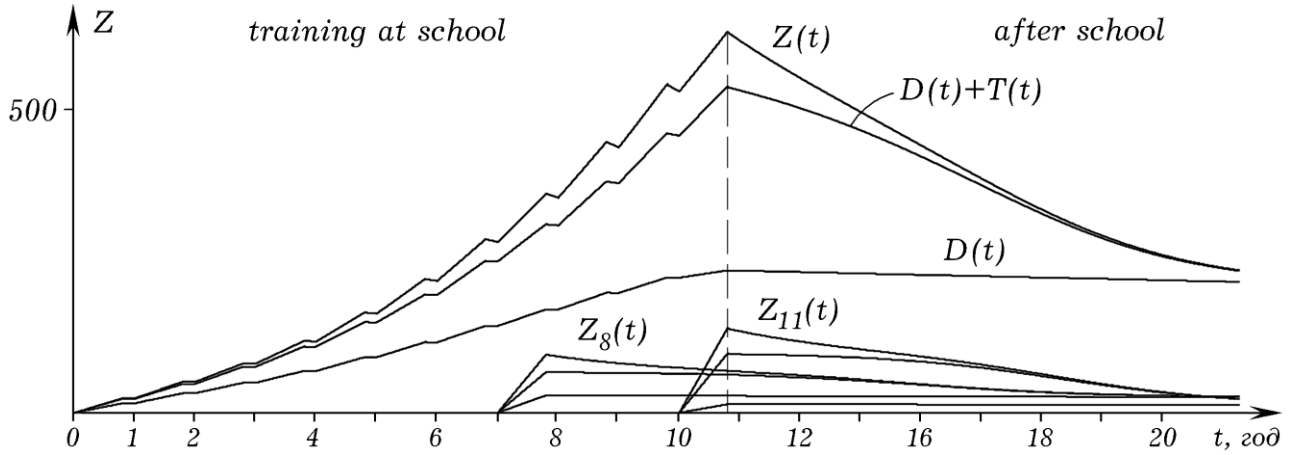

Fig. 6. The modelling results of 11-year school training.

In fig. 6 the graphs $D(t)$, $D(t)+T(t)$ and $Z(t) = D(t)+T(t)+A(t)$, which show the dependence of the quantities of the various categories of knowledge on time are presented. The small failures in the curve $Z(t)$ correspond to summer vacations. It is visible, that after leaving school the pupil forgets the first category of knowledge (used in practice) slowly, and weak knowledge of the third category – fast. On fig. 6 also the graphs of change of the knowledge quantity acquired by the pupil in 8 and 11 classes are shown.

7. Conclusions

In the paper with the help of the imitating modelling method we substantiate the features of assimilation and forgetting of: 1) the poor-associated information, which corresponds to the Ebbinghaus's law; 2) the logically connected materials consisting of information blocks, which include LMEs, connected with each other by logic or associative links. It allows to explain the sharp rise of the understanding level of the studied material happening in the course of training, and also the lowering of the pupil's knowledge level in consequence of gradual forgetting of the separate LMEs. Increase in the knowledge level of all LMEs brings understanding of all information blocks; forgetting of at least one LME causes the pupil's inability to solve the corresponding problem. Some time after the end of training the knowledge level remains high, and then, in the process of forgetting of separate LMEs, it sharply decreases, tending to zero.

These results allow to construct the imitating model of training at school. Along with this we take into account the division of the educational material into: 1) the knowledge used in the pupil's further activity, which is remembered very well (strongly); 2) the knowledge of the various theories, ideas, laws, reasonings, which are well associated with concepts, already studied by the pupil, but not used in practice; 3) the abstract knowledge of separate facts which are not used further and poorly associated with pupil's existing knowledge. The similar models allow to create the computer simulators of educational process (similar to the project simSchool (Gibson, Jakl, 2013)), which can be used for training of the students of teacher training universities and colleges.

The behaviour of the "teacher-pupil" system is the complex and diverse process; we can not take into account all set of the factors, from which its result depends. Certainly, the proposed models of the didactic systems are not describing all possible situations developing at training. The area of applicability of these models is determined by that set of the assumptions, which lays in

their basis. The further solution of the modeling problem of training requires a consideration of other factors influencing on result of training, and construction of one universal model or several simple models reflecting separate aspects of functioning of the didactic systems.

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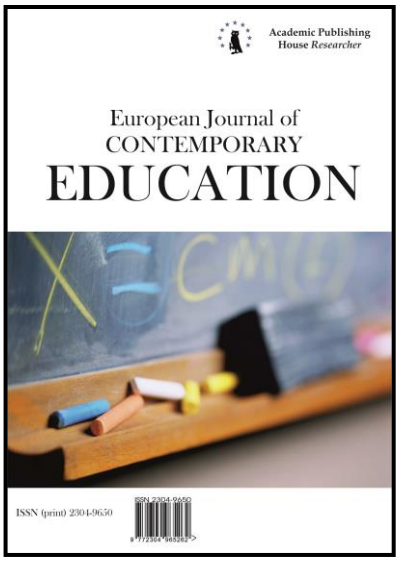

Implementing New Performance Pay-Based Schemes in Higher Educational Institutions

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Abstract

The paper presents a review of the study and practice pertaining to the effectiveness of performance-related pay with a particular emphasis on higher educational organizations. The overall research question guiding the review was to establish the extent to which performance pay-based practices have been successful undergoing great changes in management practice, and in particular, whether the implementation of new performance-related pay schemes is likely to be effective in higher educational institutions. It proves to be evident that the urgency and severity of the issues to increase the efficiency of the entire institution performance, its competitiveness and quality of products or services provided is straightforwardly related to the level of staff satisfaction, engagement, efforts, initiatives and commitments. The core objectives of the modern PRP schemes are to motivate, stimulate personnel by encouraging them work on results, implementing a strategy of organization growth and development, providing tangible rewards at the expense of incremental improvements of performance and transparency of appraisal systems. The research findings are based on the analysis of the contemporary methods of the performance measurement, which prove to improve the effectiveness of the whole organization focusing primarily on the requirements and needs of all stakeholders. Overtly, linking pay to performance is proven to increase workers' motivation, effort and loyalty to the company, covertly, it can generate psychological stress and perverse effects.

Keywords: performance-related pay, educational institutions, staff performance, measurement criteria, increase efficiency, ranking, tangible rewards.

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1. Introduction

In the employment relationship management pay plays an utmost role as it is of equal interest to the employer, employee and government. From the employer's point, as it represents a significant part of his costs, it is increasingly important to staff performance and to competitiveness, and affects his ability to recruit and retain labour force of high quality. For the employee pay is fundamental to his standard of living and welfare and is a measure of the value of his services or performance. Referring to the government, it affects aspects of macro-economic stability such as employment, inflation, purchasing power and socio-economic development wholly. Employers being mostly concerned about labour costs rather than wage rates per individual, follow the tendency of increasing and implementing a mix of fringe benefits having an important impact on pay levels.

Pay determination has a range of objectives classified broadly under four core headings which are quite controversial. The first is the concept of equity, which is directly related to pay differentials based on divergent skills and contribution, diverse commitment levels. The second is efficiency, which is closely interrelated to equity. Efficiency objectives are reflected in measurement schemes linking wages to productivity and profit, individual or group performance, skills acquisition and application, work commitment and engagement. The third objective is achievement of high macro-economic stability as it is of utmost importance to ensure high employment level and low inflation to avoid adverse impact on social morale. So, the fourth objective is efficient allocation of labour force in the labour market for preventing the increased flow of human capital to areas with higher wages, therefore, causing tough competitions, as well as creating labour deficit in less developed industrial areas. The misbalance in pay schemes can provoke increased employee turnover or *brain drain* which may lead to long-term instability both in micro and macro-economic environments.

The essence and practice of employee reward encompasses how people are rewarded in accordance with their value to an organization. It refers to both tangible and intangible (financial/nonfinancial) rewards based on diverse strategies, policies and schemes developed and implemented by companies. According to Frederick Herzberg (1968) 'Insufficient monetary reward cannot be compensated by good human relations'. Moreover, the straightforward technique to attract, retain and motivate highly qualified competent people is to execute multifaceted reward patterns. In return for their job commitment and contribution, employees expect first financial rewards, such as decent level of salary, fringe benefits, bonuses, one-time awards, profit-sharing and share options. Secondly, they look for other encouraging rewards and privileges, like management recognition of individual competence, achievement, responsibility, influence and personal development. In case of wrong implementation of employee reward strategies, organizations can face noticeable long-term side effects on the level of motivation, commitment, efficiency and, thus, personnel morale.

2. Materials and Methods

Systematic Literature review and documentary analysis

The importance of pay underwent further reformation since 1980s being named initially as performance pay-based (PRP) system and reflecting the aim to move away from service-related pay and collective bargaining models to skills-based ones linking pay directly to employees' contribution in terms of input and output, which is rather poplar as *merit pay*. The continuous reforms in managing public services during the last decades is realized through 'importation of market-type practices aiming at improving the quality of performance, creating new forms of relationship between public and private sector organizations, and new types of regulation and accountability' (Mwita, 2002).

Based on some documentary analyses and empirical studies of PRP it should be noted that after its first wide-scale introduction in the UK at the end of the 20th century many companies had great hopes that it would bring about cultural changes and encourage both organization and staff to perform better and more effectively (Kessler & Purcell, 1992).

Yet some researchers from the Institute of Employment Studies (Suff et all., 2007) detailed that at that time PRP schemes were strongly criticized by reward specialists, in-company psychologies and academics. It was advantageously considered as an effective motivational tool providing a direct incentive and being a tangible means of identifying employee's achievements and

helping to preserve key staff. On its disadvantage, PRP was criticized for being discriminatory and demotivating the majority of employees at the expense of a few high-achievers, thus weakening the very notion of fair pay and equality.

Just a decade later in 1990s it became obvious that PRP could not meet expectations of all stakeholders. As Armstrong (1999) states: 'In the post-entrepreneurial 1990s there has been a backlash against performance-related pay'. First-generation schemes introduced in 1980s failed to deliver the expected results and could not prove any connections between merit pay, performance and productivity. But even with undermined efficiency and increasing problems in implementation PRP was still being applied.

Far ahead IPRP model was in advancement and was defined as a pay progression system where an individual receives a financial reward based on his performance. As Lawson (2000) diversifies IPRP involved individual performance criteria linked to the actual performance of an individual judged or assessed against the established performance criteria, the level of employee commitment and reward received, and the established connection by the management system between the performance of the individual and the performance of the organization.

Further methodical review exposed that PRP has constantly preserved its dominating position in some sectors being the key reward tool encompassing elements both of merit-based and purely performance-related remuneration; whereas in the public sector PRP schemes appeared with some delay.

Henceforward, performance related pay being rather commonplace in the private sector, is relatively uncommon in the educational sphere. The academic labour market has always been strongly regulated by collective arrangements and widely supported by institution managements as they seek to recruit and retain highly qualified workforce. Academic work is completely profession-based and unique, as it is highly autonomous, yet collegial.

Nonetheless, the nature and environment of Russian educational system have undergone substantial changes and developments over the last decade. The whole reconfiguration is dictated by increasing percentage of student exchange programmes, universities reliance on full fee-paying international education, therefore strongly committed to meet the requirements of global educational standards. Though labour skills have been reflected in pay differentials, pay systems have still been insufficient to encourage skills acquisition and application. Whereas highly industrialized countries have built their competitive advantage by sustainable improvement of technology, productivity and quality, consequently, assuring high earnings and standards of living.

Traditionally wages and payment systems have been under government regulations determining minimum salaries based on negotiations with unions, decisions of labour courts, and employment contract. Pay increases have been affected rather by total profit than individual or collective performance, job assessment, seniority, cost of living, manpower shortage or abundance, the negotiating power of unions.

Generally accepted pay systems for junior staff have mostly demonstrated standardized character within state-owned sectors and private enterprises. National markets being protected from foreign competition were less concerned about such issues as performance, recruitment or good staff retention. Indeed, standardization benefitted both employees who considered it being equitable in terms of payment and employers who faced reduced competition on labour costs. The traditional labour market has changed its features since economies gradually entered the world trade opening up to foreign investment, cooperation and competition. The advantage of being a global player forces the local employers to compete with sophisticated technology, a much higher level of providing goods and services. Enterprises moving towards decentralization and seeking to progress and compete in the global market are necessitated to develop competitive advantages, which are affected by costs and quality. Therefore traditional pay systems were not sufficient to provide incentive to acquire skills and target global standards facilitated by correct investment in education and training. In these circumstances pay systems are management practices of enterprise level objectives and strategies, with more attention being paid to how they fit into the overall human resource management policies of enterprises (Sriyan, 2016).

3. Findings

Referring to current scientific research in the field of performance appraisal policies it is worth mentioning the term the *Performance Prism* suggested by Cranfield University. Further we

would base our research on the philosophy and exclusive approach of the Performance Prism implemented for measuring employee commitment and contribution. The Performance Prism is an innovative performance measurement and Performance Management framework of the second generation and its advantage over other frameworks is that it covers all stakeholders of an organization (12 manage, 2017).

In case of tertiary educational institutions principally the stakeholders are the government, education regulators, employers, students, sponsors and employees. The reciprocal relationship with each stakeholder is perceived by considering and meeting their unique requirements and needs. 'The Performance Prism is based on the belief that those organizations aspiring to be successful in the long term within today's business environment, have an exceptionally clear picture of who their key stakeholders are what they want'. In essence the Performance Prism has five distinct but logically interlinked perspectives, i.e. five facets – stakeholder satisfaction, stakeholder contribution, strategies, processes and capabilities. By defining all these components clearly and carefully an organization creates a clear business model and an explicit understanding of what constitutes and drives good performance.

According to Performance Prism vision organizations should start performance measurement with stakeholders, rather than with strategy, in other words, measures should be driven from stakeholders' needs. This notion completely contradicts the well-accepted concept of 'driving measures form strategy'.

Hereafter, we would cover the analysis of measurement design by answering the key five questions based on PRUE personnel performance appraisal strategy.

1. Stakeholder satisfaction: who are the key stakeholders and what do they want and need?

In public higher educational field key stakeholders are considered the government, education regulators, employers, learners, sponsors and employees. Dating from historical periods the states with strong army and high knowledge management policy, scientific advancement and development are regarded as the most progressive and welfare nations. Currently, to comply with global educational standards and demands education regulators control the whole teaching and learning process by reforming and regulating those principles. Learners and their sponsors, in case of tertiary education, parents or supporters, want and need to acquire skills and qualifications which would be compatible in today's global employment market. Consequently, the employers set performance objectives to meet the requirements of all above mentioned core stakeholders. Employees, referred as the cornerstones of any organization, are to realize the demands of all the others by ongoing improvement and enrichment of their professionalism and work effectiveness (Atkinson et al., 2004).

2. Strategies: what strategies does the organization have to implement to meet the requirements of its key stakeholders?

In this situation the organization pursues strategies encompassing performance measurement, gradual enhancement of employee commitment and development to ensure that value is delivered to other interested sides.

3. Processes: what critical processes are required to execute these strategies?

Execution of performance related pay scheme starts with the procedure of regulations in higher educational sphere, government policy changes in global economy and world affairs, thus dictating both radical and incremental changes in tertiary education.

4. Capabilities: what capabilities are necessary to operate and enhance these processes?

Coming to capabilities and competencies, which are required to manage and evolve these processes, they are based on developing human capital and improving knowledge management. Here, the best solution is hidden in setting clear objectives for every level of academic staff and promoting the new performance-based pay scheme.

5. Stakeholder contribution: what contributions are demanded from stakeholders to develop and maintain these capabilities?

Definitely, the utmost important roles do play the government and ministry of education with forthcoming regulations, reforms, financial support and widening international network in academic sphere. Secondly, the employer should develop and implement effective knowledge management strategies to achieve its targets. Finally, the personnel need to cooperate and communicate efficiently in all directions leading to self-development, academic proficiency and self-realization (Midova et al., 2016).

Hitherto some theorists believe that 'money can act as a goal in itself and can be valued by employees as a symbol of external status and internal recognition', while others argue that people, in case teachers, can gain the greatest satisfaction from work factors such as responsibility, achievement and recognition (Suff et al., 2007).

4. Discussion

The pay scheme changes – PRUE case

We now pay workers not for output produced, nor even for labour input provided, but simple for time spent on the job (Rappaport, 1999). This quote directly illustrates the payment system accepted in the educational institutions, likewise in PRUE (Plekhanov Russian University of Economics), where payment of faculty encompasses fixed pay for lecture hours delivered and academic research completed covering a range of performance criteria.

In the late 2000s educational sphere as well experienced some shrinks in allocation of government funding in universities, tough competitiveness in a crowded global marketplace and inevitable organizational changes that aligned university performance closely with the interests of private sector practices. To achieve the targets not surprisingly educational institutions have introduced a range of routes leading to success, such as performance appraisal systems, commercialization of research and education, merger and takeover bids. An insight into performance-related systems reveals an evident link between staff performance measurement and organizational objectives realization as these two factors are strongly correlated and interconnected, i.e. the inefficient commitment of staff causes a significant decrease in company performance, workforce motivation and self-esteem.

Performance-related pay was not common for Russian education sphere previously, though recently a number of universities and schools have shown interest in implementing more individualized pay arrangements. It is unsurprising that the management of PREU has shown interest in implementing more individualized pay arrangements by introducing newfangled PRP. Staff appraisal scheme called *Effective Contract* was first announced for academic year 2015-2016. The scheme is called ***Academic Staff Rating*** (ASR) including a central plank, the new possibility of personnel being able to win a reward or bonus equal to *X* per cent of their current substantive salary. High achievers would be rewarded for accomplishing a number of performance measures, and funds would be sufficient for nearly 30 percent of the permanent staff (*Top 300* people amongst 1151 employed in Moscow branch of PRUE).

Table 1. Presents Key Performance Criteria

Teaching performance	▪ Rewards in professional contests (local and overseas) ▪ Lecturing courses in English ▪ Delivery of lectures overseas ▪ Publications in foreign journals (articles, monographs, textbooks) ▪ Development of online courses, e-learning materials ▪ Coursebooks published by leading Russian publishing houses ▪ Learner feedback	40 %
Research performance	▪ Publications cited in HAC (RSCI), Scopus, Web of Science, etc. ▪ 99 h-index ▪ Patent / Invention registration / License ▪ Local / International research work ▪ Supervision of post-graduate studies for degrees (PhD, Doctor)	45 %
Social event participation	▪ Mass media publications ▪ Social events and projects	15 %

Though the above illustrated list is not complete and is still under discussion and consideration of faculties, it is noticeable that the significant proportion of efficiency measurement is allocated to research work carried on either individually or in groups with the implementation of modern teaching approaches and technological advances.

Whether the assessment criteria would lead to success or not we can understand after analyzing the progress of university research performance, in particular on the platform of elibrary.ru, which is a scientific electronic database providing a huge space for researchers, educational institutions and publications to combine their academic and scientific interests, upload and download research works, thus share professional interests and points.

In this globalized electronic database of science PRUE has its honorable position with just 6743 registered authors, 80309 published articles and research works with the total number of 225156 citations in elibrary, with overall 67250 works with 184054 citations in RSCI (date views 06.09.2017) recording 99 h-index [elibrary.ru, 2017].

Table 2. Illustrates changes in the number of publications for two previous years –Annual Index 2014-2016

Index nomination	2014	2015	2016
Total number of publications in elibrary	8850	10952	15824
Total number of publications in RSCI	7895	9557	13148
Articles cited in Scopus / WoS	100	141	312
Articles cited in RSCI (Core Collection)	217	302	454
Articles cited in HAC (Higher Attestation Commission)	3366	3404	3319
Total number of journals cited in RSCI	162	198	213
Patent registration	3	0	3
Monographs	218	254	266
Publications with overseas coauthors	46	78	213

(Date views 06.09.2017)

A detailed analysis of research performance of the university faculty reveals that there has been over 40 per cent increase in the total number of publications compared to the previous years (2014-15) when the performance pay-based scheme was just under the development, later being announced and implemented only during 2016-2017 academic year as per the *Protocol of ASR 2016-17,* ratified in 10.03.2017. The numerical data of the previous year illustrate a constant rise in every aspect of scientific and research performance of the entire organization with doubled results and in some points even triple outcomes, publications with coauthors abroad – 213 works and registration of patents – 3 units respectively.

The meticulous examination of one definite department will throw light on the argument that the perseverance and rigorousness of the concerns to increase the productivity of the whole institution, its competitiveness and quality of products or services provided is directly linked with the level of employee satisfaction, determination, commitment and expertise.

In case of the Department of Foreign Languages #1, PREU, retaining 53 employees the level of involvement and job-engagement can be demonstrated precisely based on the data delivered by Personnel Assessment Centre at the start of the academic year 2017-18 (*Protocol of ASR 2016-17*)

- In the list *Top 300* only 7 people were ranked as the best performers in 2015-16 of the Department of Foreign Languages #1, whereas this figure tripled reaching to 22 for the academic year 2016-17. The Head of the Department held the 4th honorable position for the 2016-17 rating year.
- The number of highly-rated and competitive employees has doubled since 2015-16 academic year with significant move from lower positions to higher ones (e.g. Minasyan E. holding the position 565 in ASR 2015-16 and 239 in ASR 2016-17).
- There has been an enormous surge in the amount of publications in local and overseas journals, participation in transnational conferences, attaining internationally accepted certificates, e.g. FTBE, CELTA, and in the number of registered licenses as results of intellectual activities (0 RIA license in 2015-16 and 5 RIA licenses in 2016-17 correspondingly).

- The Department of Foreign Languages #1 preserved the honorable ranks 7 and 10 amongst the most effective and laborious university faculties for the last two years due to its highly committed and rigorously working members.
- The incentive fund of the Department has accordingly increased twofold to reward the efforts of staff performance and expertise, which directly bridges the whole organization progress and growth with every employee self-realization, fulfillment and welfare.

Within the entire context of PRUE, success has been clearly articulated in official documents of the university. At this point success is defined as:

PRUE World Ranking 2015-2017 [rea.ru, 2017]

- Qacquarelli Symonds (QS) Stars 2015: 4*
- QS World University Ranking 2016/17: 801-1000
- University Rankings BRICS 2016: 90
- University Rankings Emerging Europe & Central Asia 2016: 70
- University Rankings by Subject 2017: 401-450
- Graduate Employability Ranking: 151-200
- EdUniversal Masters Ranking 2017: 1
- Ranking WEB Of Universities: Worldwide Rating: 4273 (07/2017); Continental: 1225; BRICS: 936; Russian: 75
- Webometrics Top Universities by Google Scholar Citations: 1736
- UniRank: Global: 2459 (07/2017); Russian: 37
- RCFA – English Web Content of Russian Universities: 14
- Round University Ranking: Global: 734; Educational: 550; Scientific: 37; Financial: 759: Reputation: 629; Academic: 690
- Charity Fund after V. Potanina: 58 (total score – 2,98)
- Positive Student Feedback: 10
- Times Higher Education: 25 (with total number of graduates)

Further statistics reveal the strengths and progress of the organization in other aspects of its operations, like

- An increase (to 80 per cent) in the proportion of staff with higher degrees
- Increased investment in infrastructure, research and development
- Significant rise in the number of online courses (Mail.ru rating: 4)
- National and International Accreditation of courses, teaching excellence and professional development (by European Council of Business Education, Association of MBAs, The Chartered Institute of Marketing, Chartered Institute of Management Accounts, NAC – National Anticorruption Committee, International Finance Corporation, etc.)
- Decent positions in RBK rating: 5; Forbes with 8 members; Career.ru: 5; etc.
- A 20 per cent growth in university's ranking on research performance
- A 10 per cent increase in the number of international students on the basis of exchange programmes.

The path to success has been underlain by some core drivers as highly motivated and committed staff, provision of necessary resources to achieve the above mentioned outcomes and sharing a strong culture of corporate excellence. In essence to obtain and maintain 'a culture of excellence' is realizable through implementation of performance-related bonuses apart from providing necessary infrastructure and resources. Accordingly the nomination and rewarding nearly 30 per cent of permanent workforce as being highly motivated and better performing will create a corporate culture and work environment where excellence is expected and remunerated. Consequently, the quality of employees' performance will increase mostly driven by self-development and self-sufficient factors, which will enable the university to realize success factors and meet the requirements of all stakeholders.

Performance appraisal schemes and challenges

Since the university embraced a new scheme of performance and development, it has been of utmost importance to support and train staff to face the changes and challenges, contribute and manage to perform the extra work duties, like monthly reviews and data completion in individual portfolios. To cope with the hard sides of change successfully is rather tough and it requires constant reviews, significant level of performance integrity, commitment of senior executives and staff, and the exceptional efforts from all stakeholders.

In essence all people respond to an environment positively where they are treated with respect, they are involved, given clear direction and strong leadership, rewarded for good performance. In the process of change implementation there is a harsh flank of facing resistors and easy adopters. It is essential to make employees understand the rules of combat, thus in a way of communicating, educating and conversing with the all staff. Any resistance diminishes, when people feel that their face and sociality rights are respected and rewarded, they are a part of the process and get some ownership of the whole company performance. As Harkness & Schier (2011) state 'the first thing is to create blame-free culture – hard on the issue, fair on the person'.

The primary challenge for university faculty to manage and embrace performance-related system is the limitation of academic freedom, individual interests and failing efforts to get to hard research avenues. Moreover, in knowledge-based environments there exists collegial decision making, committee goal setting, professional development and peer support. Whilst hard managerial interference and control dictated by individual performance appraisals and requirements for a greater level of accountability may lead to violating culture of unionism/collectivism, work intensification and overload causing lowered morale.

A further point of concern is the justifiable nature of performance pay-related system: whether it conforms with the employee's contribution fairly and transparently, and whether the rewards and benefits are allocated proportionally to each employee's enterprise input. Therefore, new PRP schemes need to be driven by such mechanisms and measurement criteria which would allow them evaluate and assess the diverse responsibilities of academic personnel directly involved in manifold activities - teaching, research and administration (Morris, 2005).

Personnel perspectives

Given a thorough look at the general findings of the research on the implementation of performance pay-based schemes in academic environment there can be highlighted some core benefits and drawbacks from the part of the enterprise and personnel. As it has been stated above, any reward system is designed to measure the employee performance through motivation aligning his efforts closely with the short and long-term objectives of the organization and driven by the strategy to meet the needs of stakeholders. These financial and non-financial payments are usually completed separately from regular salary schemes; consequently the recipients appreciate them highly as they are varied, separate and non-guaranteed. Another approach of novel PRP is the rise in an employee's annual salary, proving to be rather helpful for retaining employees at the top of their job rating with outstanding performance.

Nevertheless, objections to the individual performance pay revolve three overlapping concerns: firstly, teaching is multidimensional and aimed at wider outcomes, than just exam results and purely scientific research fame; secondly, teaching is a team-based activity and contradicts with the notion of individual performance-based pay schemes; and finally, teaching profession is not always motivated with financial incentives (Burgess et al., 2001).

Overall, in the frames of the presented case of PRUE, the academic workforce have witnessed a range of incremental and radical changes in the entire procedure of teaching and research work accomplished per person and in a team. The performance pay-based model has doubled the effort input in delivering lectures and fulfilling research work either individually, collectively or supervising and mentoring students in their research surveys. The staff morale is heightened and driven by new targets and opportunities, though there are easy adopters and tough resistors critically referring the whole work culture to *a rat race* (Hindle, 2008). Similarly, referring to the findings of other researchers 'incentives in the public sector could simply be optimally low, since high-powered incentives (such as individual PRP) may induce excessive competition, whereas public services require employees' cooperation' (Lucifora, 2015).

5. Conclusion

In the frames of the *Effective Contract* professional development is of key importance putting some pressures on the acquisition of internationally verified qualifications, skills and world-wide expertise. By comparing the academic personnel output, it is stated that the total performance per employee has increased at least by 20 percent in such measurement criteria as teaching performance – delivery of courses in English, participation in professional contests and post-graduate studies meant to attain doctoral degrees and further specializations. Moreover, there is a surge in the quantity and quality of publications in foreign scientific journals, participation in

international conferences and virtual course development. What refers to social events and media here can be noted a similar upward trend of active involvement mostly by students under the guidance of head tutors.

Hereafter, multiple goals of an organization will be achieved successfully if adequate appraisal and pay systems are implemented leading to increase in labour efficiency, improvement of employees' living standards, strengthening employee commitment, improving labour-management relations and securing corporate viability. Accordingly, the high-level contribution and commitment of all stakeholders is indispensable to develop and put in place a strategy of performance appraisal leading to stakeholder satisfaction, national welfare and scientific progress.

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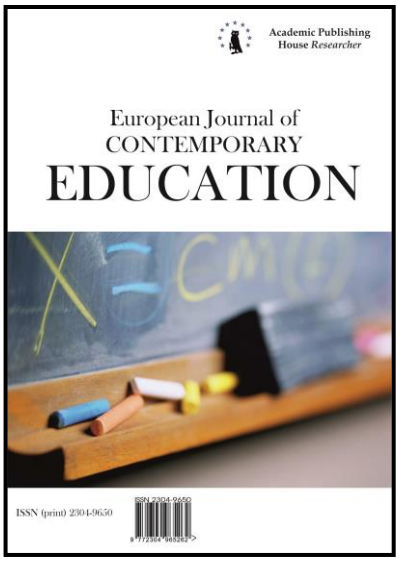

From Anxiety as a Psychological and Biological Phenomenon to Mathematics Anxiety: A Theoretical Approach

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Abstract

In the educational field, anxiety towards mathematics has been a recurrent theme that has been intensified with the results of the PISA test of 2012 and 2015. Since students who are anxious about mathematics tend to avoid any area related to mathematics, it leads to a decrease in the number of professionals in mathematics. However, this construct comes from a later history, which is the study of anxiety itself as a psychological and biological phenomenon. For this reason, this work carries out a theoretical revision of those seminal contributions that gave rise to the explanation from the theoretical construct of anxiety for later and in a specific way, to derive in the empirical studies of anxiety towards mathematics.

Keywords: Anxiety, anxiety towards mathematics, education, mathematics.

1. Introduction

A noteworthy part of the conclusions gotten from the Program for International Student Assessment (PISA) in 2012 and 2015 indicate the consequences that anxiety towards mathematics can have on students such as avoiding any related field with this matter as they can be courses, activities, workshops and situations of daily life, which in turn causes a decrease of professionals in this branch. However, this construct comes from a later history, which is the study of anxiety itself as a psychological and biological phenomenon.

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The essence of the term anxiety has been modified over time, taking different meanings according to the time in which it is studied as well as the search for the fulfillment of objectives of each author in their investigations.

According to Mc Reynolds (1975), the first findings of the concept of anxiety arise in Ancient Greece, in the Hellenistic period (323 BC and 146 BC). Nevertheless the incorporation of the term was conceived until 1926 with Freud in his work *Hemmung, Symptom und Angst*, where the word *Angst* is translated into English using the word *Anxiety,* an event that has inspired the ambiguous use of the term since the twentieth century.

However, the confusion was fueled by the lack of clarity between the reaction of the here and now and the propensity to anxiety, advances that will be indicated until the contributions of Cattell & Scheier (1961) and Spielberger (1966 and 1972a) through of the distinction of trait and state of anxiety.

2. Theoretical review

To clarify the use and implication of the concept of anxiety, it is considered a first period from the 1920's and until the beginning of the 1960's composed of four approaches: psychodynamic and humanistic, behaviorism, experimental-motivational and personality; and a second period of the 1960s and onwards, where the contributions of feature-state theories, situationalist theories and interactive theories will enrich the personality approach in addition to introducing the cognitive-behavioral approach (Casado, 1994).

The psychodynamic and humanist approach considers Freud's theories to be of great importance, which in his earlier works refers to an indifferent sign of the ego that will later become the sign of anxiety. In his first theory (1895) he presents anxiety as a reflection of the repression of sexual impulses in which he alludes to the castration complex, whereas in his second theory (1926) the anxiety will be a response to a situation of danger, generated by a past experience and introduce the terms *generation of anxiety* and *automatic anxiety*: one to describe the process of intensification of sensation in individuals and another to express the involuntary reaction to a traumatic situation so that it distinguished two types of anxiety: the realistic and the neurotic (Freud, 1895 and 1926; Snowdon, 2013).

The Humanist and Existential schools, from the philosophical point of view, considered anxiety as a response of the organism to the perception of a danger to the self. Around this thought Goldstein (1939) glimpsed anxiety as a threat to the concept of the self-given the transformation it provokes in the individual; while Sullivan (1953) placed anxiety as the result of negative perceptions that an individual perceives of people who esteem and relate to experiences in their early years.

Most of the authors of this current will relate the phenomenon of anxiety to the perception of a threat and/or fear of the unknown and which is subjective due to the past experiences of each individual (May, 1950; Basowitz, Persky, Korchin & Grinker, 1955; Rogers & Kinget, 1967; Epstein, 1967).

The behaviorism approach, part of Watson's contributions to classical behaviorism where the term anxiety was replaced by the term fear; this approach bases its studies on the objectivity of the observation of the behavior of the individuals, reason why it considered to anxiety a transitory state influenced by the environment and by the answers learned following a traumatic event (stimulus-response); which led him to consider anxiety as a negative emotional response, based on previous studies by Pavlov (Watson & Rayner, 1920).

With the contributions of Skinner (1971) appears the operant conditioning where the stimulus present in the environment produces a voluntary response that will lead to reinforce or weaken the behavior, in such a way that an aversive stimulus will produce the emotional state of the anxiety.

Mowrer (1939) dismissed the idea of anxiety as an instinctive reaction, positioning it as a learned response to conditioned stimuli. However in 1960, he recognized through his bifactorial theory that the anxiety process is generated by two components: classical conditioning and operant conditioning, since one would explain the avoidance of the stimulus that generates the fear and the other would explain the conservation of the Responses subject to that fear and negative reinforcement in the behavior of the individual at the time of avoiding it.

The experimental motivational approach is based on the theories of emotion and motivation but also includes the contributions of learning theories. One of its great exponents is Hull who relates the behavioral motivation with the *drive* (Impulse), so that anxiety becomes classified as an impulse (Hull, 1943 and 1952).

Since impulses are learned or acquired, Dollard & Miller (1950) develop the theory of impulse reduction and place anxiety as a secondary impulse that is acquired through learning. In this sense, the reinforcement (the reduction of the impulse) will have more weight than the stimulus and the response, so the degree of anxiety will be equal to the *drive* in the subject (Spence & Taylor, 1951; Hull, 1952; Spence, 1958).

The personality approach already includes the precedents of the trait-state theories with the contributions of Cattell & Scheier (1961) in which the trait of anxiety responds to the particular arrangement in which each organism reacts anxiously, that is to say, as an inherent trait of personality; while the state of anxiety is a transitory state that is accompanied by physiological responses as a function of situational variables.

For the second period in the development of the concept of anxiety delimited from the 1960s onwards, the outstanding contributions around the personality approach comprise three theories: with Spielberger (1966 and 1972a) the trait-state theories differ in conceptual form and operative the anxiety personality trait and the anxiety state, the first being a stable trait that has an individual to be prone to anxiety and the second a transient state with variation in intensity, duration and period of onset according to the subjective perception of a situation as threatening that will lead to feelings of tension and activation of the autonomic nervous system.

This author also emphasizes that the state of anxiety is influenced by the level (high / low) of anxiety trait that individuals possess and that the behaviors resulting from the anxiety state tend to act as defenses to reduce the levels of anxiety, being able to consolidate with time in specific responses to similar situations.

The second theory with contributions to the personality approach is the situationist, as its name implies, gives a greater weight to the characteristics of the given situations to explain the anxiety responses than to the variables of the personality since the continuity and development of behavior will be determined by the situations and learning they generate in individuals (Mischel, 1968).

Finally, interactive theories offer great contributions to the personality approach, since they reconcile the importance both in the internal factors of the individual as well as in the conditions of the situation to explain the behavior, whose key is the interaction of the individual in the situation (Bowers, 1972 and 1973; Endler, 1973; Endler & Magnuson, 1974; Mischel, 1977). In this way the individual's anxiety trait added to the stressful characteristics of the situation, will result in a psychological meaning that will become a determining factor for the behavior.

The study of the neurological bases of emotional behavior led several researchers to agree on a one-dimensional concept of the emotions in which behavioral, subjective and physiological indicators converged reciprocally. However, this conception of the differences present in the anxiety trait reflected in the levels of the anxiety state was not explained in all the situations that the individual experienced it.

John Lacey (1967), accounts for the separation between behavioral and physiological activation indices as well as the existence of particular patterns in body responses so that not only concomitant responses are produced but also dissociated responses are independent of the different systems of activation; which means that different response patterns are associated with both situations and individuals, this is named *directional fractionation*.

This was conclusive since previous studies on autonomic nervous system responses differed in subjects with some being more prevalent, such as elevation of heart rate, blood pressure or electrical conductance of the skin than in others (Lacey & Lacey, 1958). In addition also were found differences between the emotions; for example, anxiety states decreased gastric functions while in anger states increased (Wolf & Wolff, 1947), in the case of fear electrodermal activity and respiratory rate increased in contrast to anger (Ax, 1953).

In 1968, Peter Lang developed the three-dimensional theory to explain that emotional responses are going to respond to cognition, physiology and behavior, so the phenomenon of anxiety is to be interpreted based on cognitive, physiological and motor reactions produced by both

internal and external stimulus. However, given the poor correlation between the variables will appear the need to introduce cognitive variables.

In this way, the cognitive-behavioral approach is introduced that seeks to evaluate how individuals respond to external stimuli according to their cognitive processes. In this sense, these contributions will contribute to understanding how cognitive processes give rise to an anxiety reaction and how anxiety states influence behavior by modifying cognitive processes. Anxiety will be positioned as a result of the interpretation of the situation as various authors of this approach will support cognitive processes as responsible for the differentiation of emotions (Lazarus & Folkman, 1986).

Schachter (1966) and Mandler (1975) will agree on the need for autonomic activation as the cognitive activity to explain the qualities of emotion. To this are added the valuation theories that indicate the quality and the intensity of the emotion through the valuation that the individuals realize through the cognitive processes (Scherer, 1999). Arnold's theory (1970) will suggest the integration of neurological and cognitive aspects to evaluate a stimulus giving shape to the emotion and the behavior.

Schachter & Singer's (1962) studies will integrate somatic and peripheral physiological factors with cognitive components to explain behavior while Strongman (1978) will defend the influence of these elements without attributing them totality to the production of emotional reaction.

For Mandler (1975 and 1988) an anticipated autonomic activation of the specific emotional reaction will be determined by the particular sense that an individual attributes to a situation, such as the interruption of behavior. In this sense, anxiety will deal with an irruption in behavior that evokes a state of activation (*arousal*) by not being able to exert control on the irruption in the behavioral sequence. Spielberger (1972a) will speak of the state of anxiety as the result of cognitive assessment of either external or internal stimuli that are stressful.

Lazarus (1969) replaces the term stress anxiety, which refers to an external stimulus and a response that will include physiological changes (emotional reactions) and cognitive (cognitive assessments) in relation to conditions of the situation and the individual. For Sarason (1985), anxiety has a cognitive component composed of personal beliefs based on past experiences, self-evaluations, expectations, among other aspects that interfere with the perception and assessment of the situations faced, which increases the physiological activation. Delprato & McGlynn (1984) will understand anxiety as a product of the cognitive perception of an aversive stimulus.

In this way the concept of anxiety is changing, expanding and deepening with the contributions of these six approaches, but it is still far from providing an analogous definition. In addition, the term anxiety has been exchanged for the words stress, distress, fear, and arousal, confusing the direction in expressing anxiety as an emotional state or the stimuli that produce it.

In the case of the differentiation between the concept of anxiety and distress, López-Ibor (1969) expresses that the former is characterized more by psychic symptoms than by physical symptoms as in the case of anxiety.

Spielberger (1972a) draws a distinction between the objective characteristics of a situation of danger and the subjective reactions added to the situation: stress is produced by objective-external, physical and psychic stimuli of a situation in which aspects of experiences come into play of the individual with similar aspects both in situations as well as in stimuli, while anxiety is the complex emotional reaction of a specific situation regardless of whether the danger is real or imagined.

Thus, the state of anxiety will be the perception of a stress situation as a threat that can vary in intensity and duration according to the subjective interpretation of the individual. Spielberger (1972a) also distinguishes anxiety from fear by noting that the latter is an emotional reaction consistent with the proportion of danger, which is true and found in the external environment of the individual, whereas anxiety, on the other hand, alludes to subjective stimuli whose reaction is unreasonable in comparison with the objective danger.

For Epstein (1972) the excitation (*arousal)* generated before a threat detonates in an anxiety reaction when the individual is incapable of channeling the emotion in a congruent action.

For all of the above it is possible to understand the difficulty in conceptualizing the anxiety process, since depending on the degree of interest of the researcher, certain variables were used to provide a concept, which in turn, because there were differences between the variables used for the

study of the phenomenon of anxiety, it becomes complex to carry out a uniform concept (Spielberger, 1972a).

The second edition of the Diagnostic and Statistical Manual of Mental Disorders or DSM-II (1968) describes anxiety neurosis as a disease that is accompanied by headaches, excessive worry, tension and anxiety-producing episodes. Up to this point, as Spielberger pointed out, the concept of anxiety retakes some similar characteristics and omits others among the currents studied, but it does not unify.

DSM-III (1980) changed terminology *neurosis* (that prevailed from the first contributions of Freud) to *anxiety disorders* and marks a starting point for recognizing anxiety not only in adults but also in young people and infants.

DSM IV (1994) lists five subtypes of phobias within the section on anxiety disorders, the majority of which are environmental or situational as the *specific phobia* because it responds to particular objects and situations not mentioned in the other subtypes but will evoke significant avoidance behaviors at the clinical level.

The DSM V (2013), is the most updated reference within the field for the classification of mental disorders and argues that anxiety is characterized by muscle tension and alert to future hazards evoked by situations or objects in addition to sharing characteristics with fear, and the cognitive process of aversive stimulus avoidance as they are concurrent and associated in behavioral disorders.

Similarly, various authors agreed that anxiety is a cognitive anticipatory reaction that evokes feelings of dislike, tension, and concern about a suggestive situation of injury or subjective danger either real or imagined for the individual and produces physiological and behavioral responses (Öhman, 1993; Marks & Neese, 1994; Sandín & Chorot, 1995; Gutiérrez, 1996; Barlow & Durand, 2001; Barlow, 2002; Mato, 2006; Toro & Ochoa, 2011).

Based on the seminal theory of the anxiety construct studied over time, the conception of the anxiety construct changes from one-dimensional to multidimensional and will take into account different dimensions, from the particular trait of each individual to the characteristics of situations and the state that will generate in them based on their experiences and perceptions, producing responses of physiological, cognitive and behavioral order.

3. Anxiety in education

The first investigations about the phenomenon of anxiety were focused on anxiety in general but over time their field of study has provided specific inputs to know its effect in specific situations. Such is the case of anxiety present in the academic field where, according to Marsh (1988), has a greater influence to explain school performance than anxiety in general. In this way, school failure has been related to the anxiety phenomenon that is generated in students.

Brown & Gelder (1938) in their studies found that at the time of the exams, students who were inclined to remain calm had a higher yield than those who showed tension. Schultz & Heuchert (1983) assume anxiety in the educational field as a subjective response detonated by the stress produced by a school situation.

Regardless of the DSM, Ernest (1991) and Echeburúa (1993) distinguish three groups of disorders to recognize the phenomenon of anxiety in infants and young people, among which the "phobic" group is particularly noteworthy since they particularly include school phobia. Also, Toro (1986) and Fauvel (1991) state that school phobia is a major disorder among young people and children. Mato (2006) considers that studies from the clinical field about anxiety in childhood and in the juvenile stage have little association with school factors that are usually determinant in these populations.

Anxiety produces effects on the ability of students which makes them vulnerable in their ways of acting. Excessive anxiety can have a negative effect on the student's performance (Barker, 1984) and inhibit his ability to act (Doig, 1994).

The anxious student is concerned about the activity he is developing and for understanding his mentor at the same time that he is anxious because the result to be obtained is not what is desired or because he disappoints his mentor, which makes him have doubts about his own capacity (Cohen, 1977; Kazelskis, et al. 2000; Mato, 2006).

In this way, anxiety according to the situation can cause poor performance or be the answer to these or, be both; can produce tension at the time of going to the front to solve an activity and

before and / or during an examination. As the courses become more complex and according to the experiences, the students' vulnerability to anxiety may decrease or increase (Mato, 2006).

4. Anxiety towards mathematics

Anxiety can cause, in individuals who experience it, periods of mental paralysis especially in activities that involve constant reflection, such is the case of learning mathematics because intense mental activity makes them prone to experience this phenomenon (Mato, 2006). The Cockcroft report (1985), a document related to the didactics of mathematics, in the 80's made known this subject and its inherent activities as producers of feelings of anxiety, fear, and defenselessness among other negative aspects.

Several authors have suggested that students' reasoning may be affected by anxiety when it comes to capturing new information (Schultz & Heuchert, 1983) and problem solving (Skiba, 1990), in addition to blocking knowledge during development on a test (Fairbanks, 1992).

Cubillo & Ortega (2000) consider that mathematics learning entails difficulties and blockages in students and that to this is added the perplexity in the interaction with other people when addressing their contents as well as the tools they have on hand for develop them. Therefore, it's not surprising that they noticed that the math subject is the main cause of academic delays.

Gough (1954) was one of the first people to note this fact, since in her 25 years of experience in teaching mathematics she pointed to phobia towards mathematics or *mathemaphobia,* as the main cause of academic failures in students. Later, the term anxiety towards mathematics acquires great relevance with the studies of Tobías (1978), since this author seeks to exhort the mental health in the learning of the mathematics that is obtained from the will to learn and that is translated into confidence to develop mathematics as a tool in everyday life and achieve success in mathematics tasks.

However, as with the construct of the concept of anxiety, the concept of anxiety towards mathematics also shows confusion, deviations, and poor agreement among authors who have studied it over time (Newstead, 1998). In this sense, some researchers speak of the topic anxiety towards mathematics with a focus on the intrinsic characteristics of the discipline, while other researchers specify their work on the type of anxiety experienced in the study of mathematics as an external factor produced by environmental factors and social.

For example, in the contributions of Biggs (1959) his studies on numerical anxiety share factors of personality as well as attitudes but without distinguishing one from another; although it should be noted that the distinction between trait and anxiety state develops from the 1960's onwards with the contributions of Cattell & Scheier (1961) and Spielberger (1966 and 1972a).

Studies such as those by Resnick, Viehe & Segal (1982) visualize mathematics anxiety as a topic related to self-confidence in the learning ability of mathematics, whereas in Hembree's (1990) study, it is rather a state of anxiety that occurs in situations related to the math subject.

Wigfield & Meece (1988), on the other hand speak of affective-negative reactions directed at the mathematics. In the same way, there are very ambiguous or generalized definitions in this respect that lead to emphasize pathological emotional reactions to this subject and that result in inhibiting the taste for learning (Dreger & Aiken, 1957; Kogelman, Forman & Asch, 1981; Gottfried, 1985; Truttschel, 2002).

Lewis (1970) links the term mathematics anxiety with the feeling of fear to a situation that is perceived with dislike and that has a focus towards the future; so May (1977) alludes to the feeling of uncertainty and defenselessness that will not only produce emotional but also somatic disturbances. For Wood (1988), anxiety towards mathematics is related to the lack of welfare before a task that is incumbent to the mathematics work.

Some authors consider multidimensional to the phenomenon of anxiety towards mathematics since complies attitudinal elements, emotional and cognitive (Hart, 1989) and that may contribute to the development of attitudes towards the subject (Hauge, 1991), in addition to evoking psychophysiological reactions (Fennema & Sherman, 1976; D´Ailly & Bergering, 1992). That would be consistent with the evolution of the concept of anxiety in the second period marked after the 60's which gives rise to the interactive theories.

Spielberger (1972) anxiety is the adaptive reaction of organisms to a perceived threat that is detonated as a result of a stressor and that translates into a result based on the previous experience of the individual whose stay will depend on the current rating and how is front. This way, you can

understand the mathematics anxiety, as a state and a process that is particular in each individual in its way of reacting to mathematics situations.

Following the line of Spielberger, McLeod (1989) observed to mathematics anxiety as a threat to the self-esteem of individuals, so your model responds to three types of background: the environmental, the attitude and the situational. So the interaction with these factors will produce somatic responses in individuals. Richardson & Suinn (1972), mathematics anxiety consists of feelings of stress that create conflicts in the processes of reasoning and use of mathematics learning in school and in everyday life.

Hadfield, Martin & Wooden (1992) studies focused on the emotional impact, i.e., they saw the mathematics anxiety as a reaction of discouragement to any mathematics activity. However, mathematics anxiety and despair are not synonyms (Tobías, 1993).

It should be noted that there is some disagreement among theorists about whether mathematics anxiety has beneficial aspects for students who experience it, or if on the contrary, it is completely harmful; for example, Hebb (1955) showed that experience it can contribute in the implementation of activities related to this matter successfully although he did mentioned that if certain limit is exceeded, it produces anti-competitive effects.

Satake & Amato (1995) found a positive relationship between anxiety and performance since japanese primary school, with greater anxiety towards mathematics students had a better performance in respect of which had low results; although it is worth mentioning that japanese student must meet very strict requirements to enter a prestigious secondary education by which these results can be attributed to cultural factors.

Guerrero, Blanco & Castro (2001), pointed out that anxiety facilitates learning when the mathematics tasks are mechanical, simple and minor, but also specified that this result is obtained when these tasks do not threaten the self-esteem of students and they have the ability to overcome anxiety. Studies of Bush (1991) claim that students who experience this phenomenon reported instructional performance, i.e., that experience math anxiety helps them to achieve success. For Resnick et al. (1982) the decrease in anxiety in students is not associated with their success in this matter.

Other studies indicate that the reduction of anxiety leads to a trend of improvement in the ratings (Chiu & Henry, 1990; Hembree, 1990; Meece, Wigfield & Eccles, 1990; Leder, 1992).

Several authors have agreed that anxiety towards mathematics affects negatively the students since its capacity is affected, or in the worst cases, disabled (Aiken, 1970 and 1976; Lazarus, 1974; Fennema, 1977; Fox, 1977; Betz, 1978). Hannula (2001) points out that interact with anxious students is more complex compared to students who do not have anxiety, since the first tend to predispose negatively towards mathematics learning what affects their cognitive processes.

Given that fear affects the processes of conceptual thinking, anxiety towards mathematics can block the logical reasoning regardless of the potential that students have for this subject (Fairbanks, 1992), which leads students to memorize mathematics knowledge rather than to understand them (Wells, 1994; Puteh, 2002). According to Auzmendi (1992) the level of anxiety towards mathematics varies among individuals since it will depend on the level of proficiency of each student and the particular intensity with which it is perceived, what will inhibit its ability to integrate new knowledge and created antipathy towards the matter.

Mathematic anxiety can affect individuals' ability to perform mathematics problems (Wine, 1980; Hembree, 1990; Ashcraft & Kirk 2001), may inhibit the ability to acquire complex learning (Guerrero, et al., 2001), can cause physiological reactions such as sweating, tremors, headaches, stomach discomfort and making students feel sick (Hodges, 1983; Hoyles, 1991), may cause the student to miss classes (Meece et al., 1990), as well as to avoid math courses in general (Armstrong, 1985).

In addition, you can also inhibit the efficiency of the efforts in the mathematics field (Skemp, 1986), difficulties for the taking and evaluation of decisions (Echeburúa, 1993) and cause a psychological habit between the subject and failure (Morris, 1991).

Experiencing anxiety can be as a vicious cycle: to be present, the trend in the results of the tasks to be carried out will point to a poor performance and these failures in the performance of tasks will result in producing more anxiety (Biggs, 1985; Mato, 2006); and usually, the anxiety is experienced by past experiences (Tobías, 1987).

Mato (2006) points out the existence of two theoretical models of great influence in the study of the anxiety towards mathematics, one is the theoretical model of interference based on the works of Mandler & Sarason (1952), Liebert & Morris (1967) and Wine (1971) and the theoretical model of deficit represented by the work of Tobías (1985). The first suggests that a high level of mathematics anxiety (produced as a result of past experiences) impact on success in a negative way while the second is developed by the deficiency of the students at the time to carry out their learning and mathematics activities, which produces the phenomenon of anxiety.

Anxiety towards mathematics is a phenomenon that doesn't discriminate age, since it is present both in children, as young people and adults (Hoyles, 1975; Tobías, 1980; Quilter & Harper, 1988; Thomas & Costello, 1988). However, studies of McLeod (1993) indicate that it arises during primary education, issue that could arise from that stage of life onwards and by all of it. Bornas (1996) expressed with mathematics anxiety children also experience other cognitive distortions as an excessive concern, what back them prone to present thoughts linked to his intellectual limitations and its failures.

Karp (1991) as well as McLeod, says that primary education is critical to consolidate or lose confidence in math skills, question leading to fixations on the subject will be more developed during the secondary education (Betz, 1978; Tobías, 1980; Cockcroft, 1982; Frary & Ling, 1983). In this respect, Norwood (1994) found in his studies that 68% of high school students experience high levels of anxiety towards mathematics. Also at this stage the mathematics success begins to decline (Brush, 1985; Wigfield & Meece, 1988; Hembree, 1990).

On the other hand, some researchers expressed a marked difference in the intensity of the phenomenon in students according to their gender, being affected mainly the female gender (Sells, 1973; Ernest, 1976; Hilton, 1980). Stent (1977) and Brown & Gray (1992) point out that up to 12 years, the difference is not visible. Halpern (1986) does not specify the age but says that adolescence is when this difference becomes observable. Tobías (1980) also agrees to that the intensity of the anxiety towards mathematics is higher in women than in men.

Some studies argue the existence of a biological basis (Benbow & Stanley, 1980; Halpern, 1986), as it is the theory of the cerebral laterality, which refers to both psychological and neuropsychological functioning differences between men and women. Other works have been also reported gender differences in affection and attitude toward the subject of Mathematics (Fox, 1977; Reyes, 1984; Stage, Kreinberg, Eccles & Becker, 1985; Meyer & Fennema, 1988).

Otherwise from other studies, such as those of Frank & Rickard (1988) which accuse the lack of prior knowledge as proof of the experienced anxiety. The previous argument is validated by studies like the of Betz (1978), since with three different samples see anxiety highest in the older women with respect to men, women in which his mathematics background is less since they have left the mathematics field for a longer time, factor contributing to their higher level of anxiety. Brush (1978) also found that women with the same level of mathematics instruction than men, had the same level of anxiety that they and no more.

The Autonomous Learning Behavior model (ALB) of Fennema & Peterson (1985) suggests students independent learning shaped by internal and external influences to determine gender differences, i.e., that the experiences of independent participation will be influenced by the appreciation of themselves as well as matter and social stereotypes and expectations of others. The success of the autonomous student strengthens your inner belief system that consists of self-confidence, the perception of the mathematics knowledge as useful for their life as well as the independence between the math and their sexual role.

Shibley, Fennema, Ryan, Frost & Hopp (1990) in his study found that women tend to have more negative attitudes towards mathematics than men; one of its conclusions sheds the stereotype of math as a masculine domain which may threaten the self-esteem of women to carry out the study of mathematics. In this same regard Tobías (1978) and Mato (2006), reflect that social expectations can contribute to see math more as a male field, what you see reflected in the beliefs of women feel with disabilities mathematics field; alternatively, there are wicked opportunities to engage in this field (Tobías, 1976).

However, all the authors analyzed agree on giving greater importance to the previous mathematics background as the cause of the anxiety towards mathematics than to gender.

On the other hand, cognitive processes have a great influence on learning and mathematics performance, regardless of the previous background of students (Llabre, Suárez, 1985). Gómez-

Chacón (2000) confirms the existence of a significant relationship between cognition and affectivity, which divides the importance between the process of valuation (culture) and the cognitive process (reasoning). He discovers that mathematics learning is seen as constructing the students' social identity, that is, as the acquisition not only of knowledge (culture) but also as belonging to a group (social process).

While several authors place the anxiety towards mathematics as inherent in individuals who fail in this area, authors like Ashcraft, Kirk & Hopko (1998), recognize its existence also in the successful students, which would lead to more trouble in respect of the selection of a professional career. Therefore, while some students hate successful results in that subject does not mean that they do not seek to avoid it (Onwuegbuzie, 2003; Muñoz & Mato, 2008).

Now, the contradictory findings of these studies have kept the interest of researchers (Kirkland, 1971); problems that can be attributed to the differences between trait anxiety and anxiety are not taken into account (Sieber, 1969).

When students blocked it and allow the feeling of anxiety to exceed them, these difficulties are translated to problems presented in their daily lives for the rest of their lives (Mato, 2006). Initially, the studies carried out on the topic of anxiety towards mathematics focused to a public university or adult although studies such as McLeod (1993) have made the observation that both the attitudes and emotional reactions to the matter of mathematics can be formed at an early stage (between 9 and 11 years old).

Negative attitudes towards mathematics once formed hard are modified and persist in the adult stage, generating adverse consequences on people who have anxiety. Within the consequences that afflict those who suffer from anxiety towards mathematics are interruption of conceptual thinking and processes of memory, under performance, the avoidance of the subject and the abandonment in the choice of careers related to this area coupled with negative feelings of guilt and shame (Brush, 1978; Burton, 1979; Hendel, 1980; Resnick, et al. 1982; Armstrong, 1985; Preston, 1987; Seaman, 1999; Puteh, 2002; Mato, 2006).

This emotional reaction is strengthened in the classrooms and is reinforced with each error that students have in the exercises, their learning and exams; and therefore relate inversely with positive attitudes towards this matter. While it is true that anxiety can assimilate a mechanical learning, it has a blocking effect of complex learning (Gairín, 1990).

5. Study model

In this way the revised theoretical contributions allow you to raise a causal model of study based on theoretical and empirical reality of anxiety, as a construct:

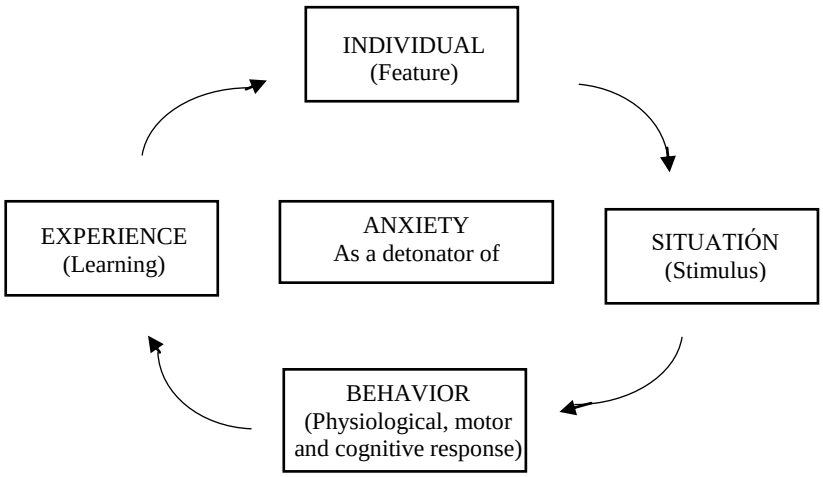

Fig. 1. Construct of anxiety
Source: Created with information from the literature

In this model the anxiety is the central aspect which affects the individual in accordance with their particular trait, which is involved in the situation depending on the perceived stimuli to the features that contain and subsequently leads to the generation/evocation of behavior through responses of physiological, motor, and cognitive order that will shape the learning and will form a new or repeat experience based on previous experiences.

On the other hand, a proposal for a model from anxiety in general to mathematics anxiety is represented in the following way:

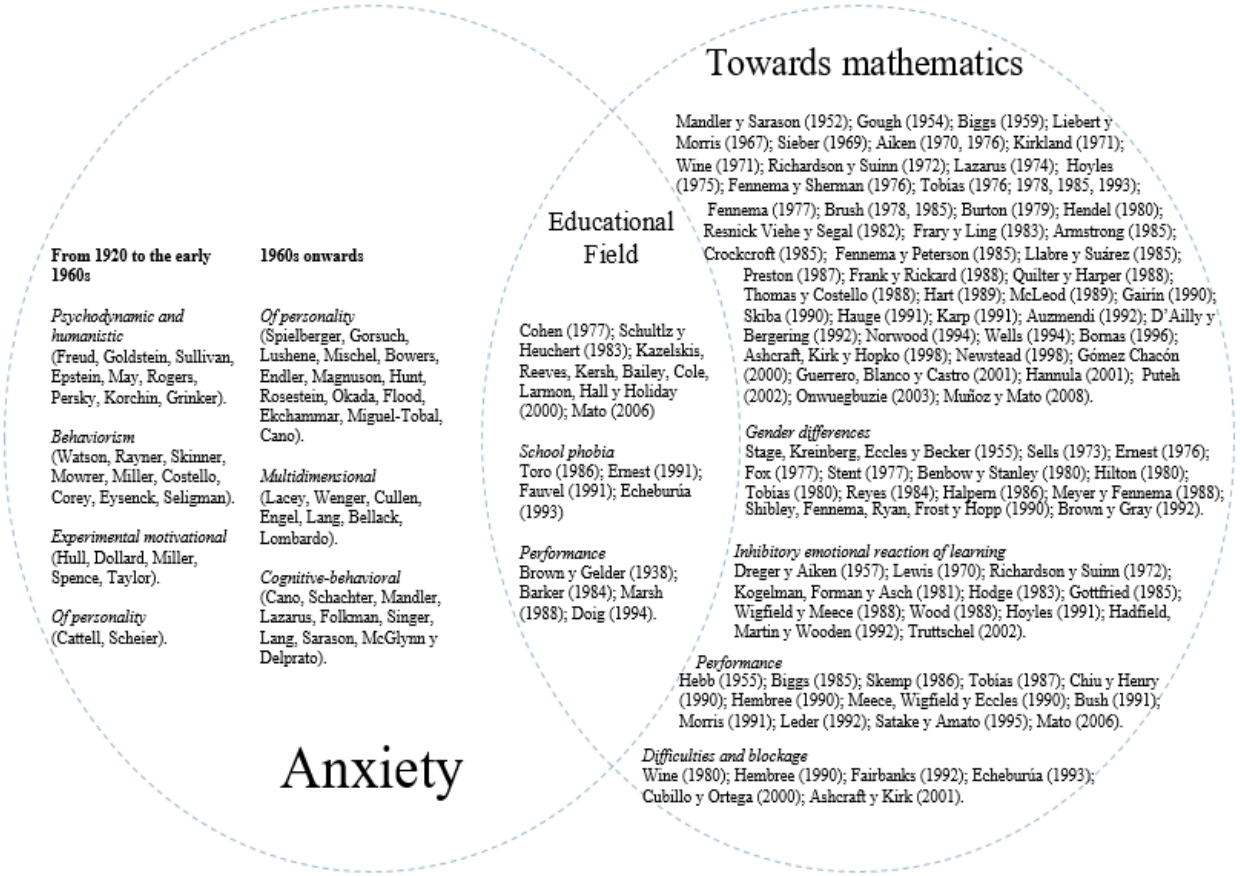

Fig. 2. Construct from anxiety to mathematics anxiety
Source: created with information from the literature

Once this proposed study model has arisen, seeks to demonstrate empirically that the level of anxiety towards mathematics that present students of higher education, may become conditioned to various elements of cognitive, behavioral, performance and others associated with the practice of mathematics.

With the review and analysis carried out on theories and empirical studies, it is now fully feasible to raise the test hypotheses and consequently to derive from them the operationalization of the variables involved to obtain the indicators and instruments of data collection that will be used for the development of the respective field work, in a later empirical study.

6. A final reflection

Multiple investigations developed around the phenomenon of anxiety, since up to anxiety disorders to anxiety neuroses, passed to build the theory of anxiety in our days. During the process of the formation of the theory of anxiety have been measured several variables and factors with different methods taking the conception of this phenomenon of one-dimensional

multidimensional, event coupled with the evolution of the study of the anxiety towards mathematics.

Anxiety towards mathematics continues to be an object of study of great interest because of its impact on society both in the academic field as well as in daily life since their learning is necessary for successful social integration posed today in day permanent technological changes, regardless of that this subject is perceived as boring frustrating or difficult, that generates his aversion and rejection (Gil, Guerrero & Blanco, 2006).

There is also a required minimum level of literacy in the field of mathematics to engage successfully in society, which becomes a problem for those individuals who don't have this (Lapointe, Mead & Phillips 1989; Tobías, 1993; González, 2000; Muñoz & Mato, 2008; De Moura, 2011).

It's no wonder why that mathematics are a significant filter within the Education category (Sells, 1973; Perl, 1982; González, 2000), reason that invites to the analysis and understanding of the way it conceived the beliefs and assessments on this subject and which influence the success or failure of students during their learning.

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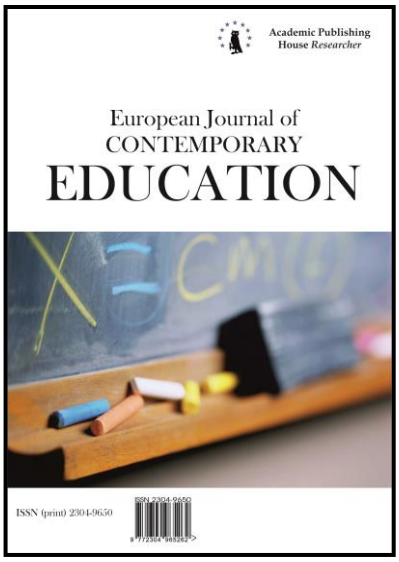

Preparation of Staff of Tourism-Recreational Sphere in Russia

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Abstract

Subject. The domestic system of a professional training for tourist-recreational activity and resort business is considered in the article. The topic of the research can be considered actual due to the growing interest of the subjects of the tourist market to the development of the country's activities, the success of which depends on the availability of qualified personnel.

Goals. Analysis of the system of higher education in the training of personnel for the tourism industry in Russia and abroad in the context of the development of the tourism industry. Formulating problems and identifying ways to improve it.

Methodology. The research conducted by the authors is based on the results of an analysis of scientific works in the field of training of specialists in the tourism industry, as well as works devoted to improving the competitiveness of Russian education. Statistical processing subjected to a significant amount of data characterizing the state of the tourist market and the market of educational services in Russia.

Results. The role of the system of higher education in the training of personnel for tourist and recreational activities from the position of development of domestic, including entry, tourism in the Russian Federation was considered in the research.

Conclusion. It is concluded that the training areas implemented by the country's universities in the field of tourist and recreational activities and resort business are in demand by applicants. The recommendations on the improvement of the FGOS VO are formulated.

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Keywords: training direction, bachelor's degree, master's program, internal tourism, student, consumer.

1. Introduction

The majority of the country's population lives in the urban environment, which contributes to the reduction of physical strength due to the negative influence of the ecological situation, intellectual information overloads that cause mental disorders and emotional stress. Tourist and recreational services contribute to the restoration of physical strength of man, to increase stress resistance, while their effective development is possible only if there are highly qualified personnel.

The tourist market of Russia is currently in the stage of recovery, which is characterized by the growth of market efficiency indicators; increasing in competitiveness of domestic tourism programs; the investment attractiveness of various market segments. Over the past three years, the Federal Agency for Tourism in the Russian Federation has noted an annual increase in the number of tourists visiting our country with tourist purposes on average by 10 %. Comparing the indicators of tourism in the economies of the countries of the world and the Russian Federation, it should be noted that the domestic indicators are much lower than the world average (Analytical Center under the Government of the Russian Federation...). In 2015 the direct contribution of tourism to GDP was 1.5 % or $ 17.9 billion, while the total contribution was 5.7 %. According to these indicators, Russia occupies 173 and 150 places in the world respectively (Russian Education Federal Portal...).

The tourism sector of the Russian economy requires activities that can increase its share in the country's GDP and ensure the development of all types of tourist activities. One way to change the current situation in the market in question is to attract personnel who have professional competencies in the field of tourism and resort business. In turn, it is necessary to pay attention to the training of personnel for organizations engaged in medical and health tourism, since their activities are aimed at meeting the medical, social and psychological-physiological needs of the individual.

2. Results and Discussion

The problem related to the selection, training and subsequent improvement of the qualification of workers in the tourism industry, including sanatoriums and resorts, is the object of research by many Russian scientists, among which there are works by A.Yu. Aleksandrova (2016), A.S. Bainova (2010), A.M. Vetitneva (2014), N.A. Vichkanovoy (2010), I.V. Zorina (2007), A.D. Nekipelova (2012), VI Kruzhalina (2016), M.V. Polevoy (2010).

A.Yu. Aleksandrova considers that «... the synergy of education and tourism ultimately allows better meeting the needs of different age and social groups in the system of lifelong education, better revealing the cognitive forces and creativity of people, educating a person developing» (Aleksandrova, 2016).

According to I.V. Zorin and A.D. Nekipelov, the shortage of qualified personnel in the tourism industry is the reason for the restraining growth in the indicators of the tourist market, since this entails a low quality of service (Zorin, Nekipelov, 2012).

Polevaya M.V. argues that the existing domestic system of sectoral training of personnel for the tourism industry does not meet the requirements imposed on it by employers, consumers and the labor market (Polevaya, 2010).

The role of additional professional education in the system of training the personnel of the tourism industry has been studied in the works of A.Yu. Fodorya. The author emphasizes the special importance of implementing the programs of additional professional education, which consists in the formation of an adequate self-assessment; building a system of motivation and adaptation skills in a new environment; mastering conflictological knowledge, management skills and conflict prevention; development of communicative and psychological literacy (Fodorya, 2013).

A comprehensive approach to the training of tourist personnel as one of the factors of development and creation of special recreational zones was considered in the works of V.I. Kruzhalina (Kruzhalin, 2016).

The changes in the system of Russian higher and secondary vocational education in training the personnel of the tourism industry contributed to the positive changes in the tourist industry. The prerequisites for the changes were the growth of consumer demand for tourist programs within the country, an increase in the demand for personnel in the industry and an increase in the requirements for the level of service and quality of service.

Educational standards of professional training of specialists for tourism and recreation and resort business over the past five years are subject to continuous improvement in connection with the changing educational paradigm.

Currently, the Federal State Educational Standards for Higher Education (hereinafter referred to as FSES HE), designed to train the employees of the tourism business, include standards for the preparation of bachelors and masters. The system of training the sectoral personnel also includes the implementation of postgraduate education programs. The experience of building a foreign system of professional training of tourism industry personnel may be characterized by a high level of practical orientation of programs, involving the mastery of production experience and the formation of managerial skills. The list of training programs for specialists in the tourism industry is presented in Table 1.

Table 1. List of programs by levels of training

Level of education	Russian training system	The system of training in the world leading countries*
Directions of training of specialists in secondary vocational education	«Tourism» (FSES SVE 43.02.10) «Service in transport (by mode of transport)» (FSES SVE 43.02.06) «Organization of service in catering» (FSES SVE 43.02.01) «Hotel Service» (FSES SVE 43.02.11)	Direction «Tourism» specialization: - Tourist manager; - Specialist in advertising in the field of tourism; - Worker of recreation and entertainment centers; - Cook; - Waiter; - Flight attendant; - Manager for work with people; - Specialist in sports and extreme sports; - Event manager.
Directions of bachelor's training	«Tourism» (FSES HE 43.03.02) «Service» (FSES HE 43.03.01) «Hospitality» (FSES HE 43.03.03)	«Tourism»; Hotel business; «Hospitality»; «Management in the field of entertainment»; «Catering»; «International hotel management»
Directions of master's training	«Tourism» (FSES HE 43.04.02) «Service» (FSES HE 43.04.01) «Hospitality» (FSES HE 43.04.03)	Master of International Hospitality Management
Directions of postgraduate retraining (AVE programs)	Management of tourist and recreational projects; «Quality management in the hospitality industry»; «Branding of tourist destinations»; «Innovative technologies for organizing the activities of hotel and tourist complexes» (Official page of FBGOU VO «Moscow State University named after MV Lomonosov»...)	«MBA Hospitality, Finance and Marketing» BBA Hospitality

* Portal of Federal State Educational Standards of Higher Education...

* USA, Switzerland, Malaysia, Spain, France, United Kingdom, Australia

The table doesn't provide a complete list of programs implemented by leading foreign universities, since the national system for training sectoral personnel in each country is based on the needs of the domestic labor market and the level of development of tourist and recreational activities.

Within the framework of the article, special attention will be paid to the implementation of the FSES HE in the areas of training bachelors and masters 43.03.01 «Service», 43.03.02 «Tourism» and 43.03.03 «Hospitality» by the universities of the Russian Federation and the Perm region.

When implementing the training directions for FSES HE, it is mandatory to fulfill the requirement to recruit disciplines (modules), namely 50% of the bachelor's educational program should constitute the disciplines recommended by the standard. In the preparation of masters only 30 % of the disciplines should be selected from the recommended list given in the standard. Thus, for the content of the remaining part of the disciplines of the educational program (50 % for bachelors and 70 % for masters) is responsible for the each university (Portal of Federal State Educational Standards of Higher Education…). When formulating an educational program aimed at training personnel in the tourist market, it is necessary to take into account the methodological recommendations of training and methodological associations, expert opinion on the quality of training, the need for a regional labor market, trends and prospects for the development of the tourist market in the Russian Federation and the region, as well as its own innovative pedagogical technologies.

In teaching the disciplines of educational programs in terms of increasing the level of knowledge of students and the competitiveness of training areas in general, the faculty of the university uses a variety of innovative pedagogical technologies. As applied to the tasks formulated by FSES HE in the areas under consideration, innovative methods include conducting scientific and scientific conferences, cognitive excursions, organizing professional quizzes with the participation of representatives of the tourism industry, developing business games that are maximally adapted to the requirements of the tourism services market, as well as cases involving production critical thinking and analysis skills.

The integrated form of training sessions involves the integration of several disciplines into one lecture, a seminar, which allows us more deeply absorb the intersubject connections and the role of the phenomena studied, the patterns in professional activity, interrelations with other scientific and practical spheres. For the effectiveness of teaching tourism this method provides:

- reviews of new information (innovations, discoveries, successful projects) in the field of international and regional tourism;
- ensuring the interaction of the university and the business community as the creation of a qualitative link between the future graduate of the university and the proposed place of work;
- formation of students in the installation for professional self-development,
- development of case-studies with the presence of the author's set of region-specific excursions and services (various types of tourism);
- development of free excursion routes for residents and visitors of the city, the region.

The use of distance learning courses (online lectures, webinars, lectures, presentations, video and audio materials) in the sphere of tourism allows solving not only didactic but also practical tasks, in particular, consideration and involvement of regional resources in the tourism and recreation sphere, development and the introduction of new tourist and sightseeing routes and so on. In particular, online lectures and webinars are used in those cases when direct communication between the audience and the lecturer is necessary (for example, when studying the most difficult, problematic or important topics for listeners, when feedback is needed for discussion, questions from the audience, etc.). The schedule of online lectures and webinars should be planned in advance for the entire course. The final control of knowledge for distance learning is carried out through online testing, professionally-oriented tasks and individual assignments.

An important innovative method is the organization of student participation 43.03.01 «Service», 43.03.02 «Tourism» and 43.03.03 «Hospitality» in volunteer movements, which stimulate future specialists to professional growth and skills development. Invaluable is the experience of the Volunteer program «Sochi-2014», which allowed determining the mechanisms

for organizing volunteer movements throughout Russia, identify problems and identify ways to address them.

The dynamics of indicators characterizing the demand for bachelor's programs for the tourist and recreational sphere is shown in Figures 1-3.

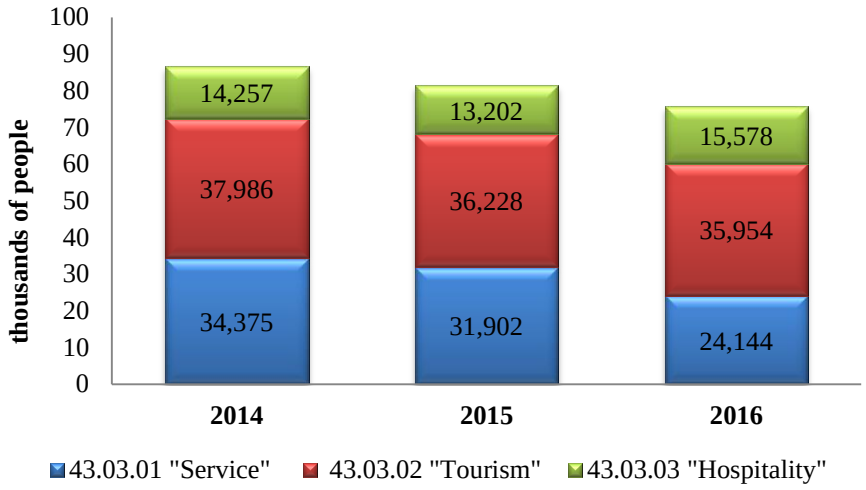

Fig. 1. Applications for training under the bachelor's programs have been submitted (Ministry of Education and Science of the Russian Federation...)

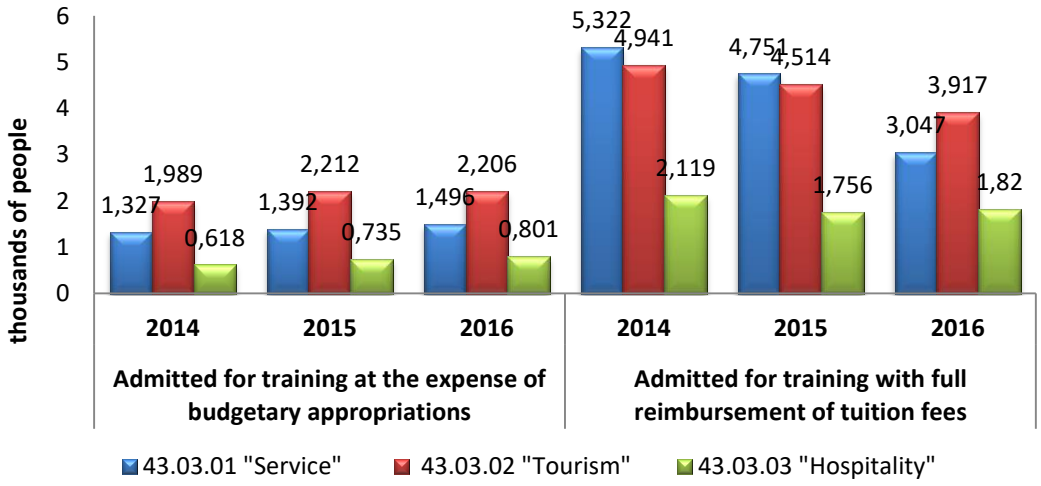

Fig. 2. Distribution of entrants' admission in the areas of preparation and form of funding (Ministry of Education and Science of the Russian Federation...)

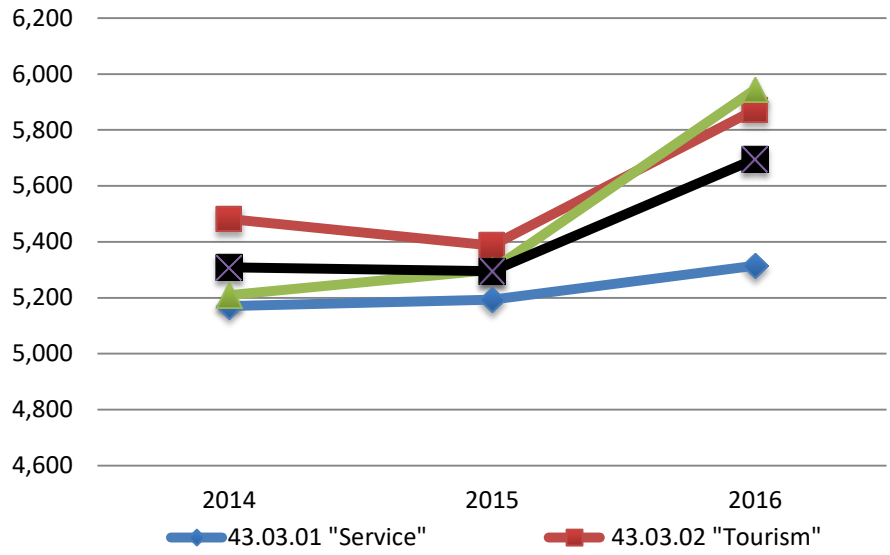

Fig. 3. The number of people applying for one seat (Ministry of Education and Science of the Russian Federation...)

The presented data testify to the sufficiently high interest of the entrants to the directions of preparation under consideration. The average competition for admission to the training of bachelors in 2016 is 5,695 people per seat (2014 -5,309, 2015 - 5,295). Of the three areas of bachelor's training, the highest competition was registered in the direction of 43.03.02 «Tourism» (5,975 people per place in 2016). The total number of applications submitted for the considered areas of bachelor's training in 2016 was 75 676 people, while the total number of students enrolled in higher education in these areas was 13 287 people (17.56 % of the number of applications). Among the students enrolled for the first year, the greatest number of students was marked in the direction of training bachelors 43.03.02 «Tourism» – 6 123 people (46.1 %).

In our opinion, the reasons for the lack of high interest in the direction of 43.03.03 «Hospitality» are follows: its narrow specialization and direct focus on a specific market; a small number of universities implementing educational programs (10.01 % of the total number of universities in Russia as of September 1, 2016).

Direction of training 43.03.01 «Service» for three years is of intermediate importance in terms of the number of applications submitted and accepted entrants, however, in 2016 there was a sharp decrease in the number of applicants enrolled in comparison with previous periods, which resulted from a decrease in demand. This is also evidenced by the fact that the number of places financed by budgetary allocations in 2016 increased by 7.5 % compared to 2015.

The analysis conducted in three areas of training bachelors showed that approximately from 20 % to 30 % of people in 2014-2015 were admitted to universities due to the federal budget of the Russian Federation, and in 2016-2017 from 32 % to 42 %. Thus, in 2014 28.7 % of applicants were enrolled in the direction of training for 43.03.02 «Tourism» due to the appropriations of the federal budget, and in 2017 – 41.71 %. Thus, increasing the number of places in higher education institutions financed by budget appropriations for these areas of preparation, the states provide the necessary volume of intellectual capital to the tourism industry in the future.

Data on the number of students in full-time and part-time forms of study in higher education institutions of the Russian Federation who are studying in the considered areas of bachelor's degree are presented in Figure 4.

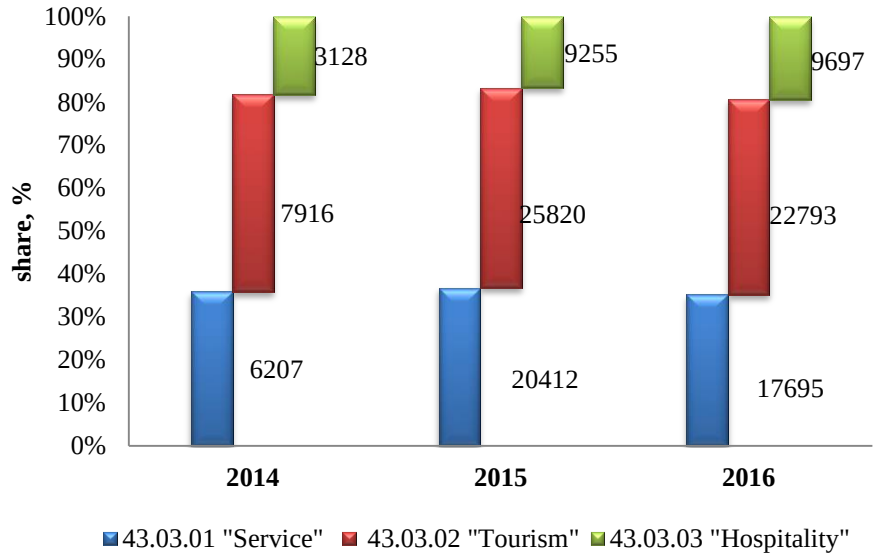

Fig. 4. The number of students in the areas of training bachelors in higher education institutions of the Russian Federation (Ministry of Education and Science of the Russian Federation…)

The total number of students enrolled in the areas of training for bachelors as of 01.10.2016 was 50 185 people, hereby 17 064 people (34 %) being trained at the expense of budgetary allocations. In the context of the directions for preparing bachelors, the distribution of the total number of students is follows:

- the greatest number of students as of 01.10.2016 was noted in the direction of training 43.03.02 «Tourism» – 22 793 people (45.4 %), however, the value of the indicator is lower than the level of 2015 by 11.7 %;
- the direction of bachelor's training is 43.03.01 «Service» (17 695 people) is in the second place by the number of students who are educated in the field of tourism and resort business in higher educational institutions of the Russian Federation;
- direction of bachelor's training 43.03.03 «Hospitality» takes the third place in the number of students in 2016 – 9697 people (19.3 %), however, when compared with previous periods, there was an increase in the number of students among the three areas of training;
- comparing the indicator of the number of students in higher educational institutions of the Russian Federation from 2013, in which the number of educational institutions implementing training directions has sharply increased, it should be noted that the 2016 contingent has exceeded the value of 2013 by an average of 8.53 times.

The dynamics of the number of graduates has similar trends with the dynamics of indicators of the number of students in Russian universities. An extremely small number of students graduating from undergraduate programs in one of three areas continue their further education in the magistracy (see in Figure 5).

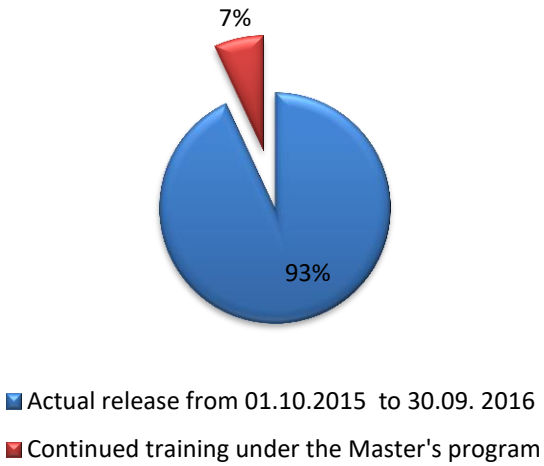

Fig.5 Distribution of the number of graduates of 2016 for the training directions in question as of 01.10.2016. (Ministry of Education and Science of the Russian Federation…)

When analyzing the reasons for the lack of desire for graduates to continue their studies in master's programs, the following was revealed (Nagoeva, Oborin, 2015):

- lack of understanding of the basic principles of the magistracy and its feasibility;
- non-compliance of master's programs of some Russian universities with employers' requirements;
- not the desire to continue training because of the physical and moral weariness of the student;
- high cost of training in the magistracy and at the same time a small number of budget places;
- other reasons (change of marital status, lack of possibility to combine work with study, migration, etc.).

Data characterizing the state of the contingent studying in the areas of training for masters 43.04.02 «Tourism», 43.04.01 «Service», 43.04.03 «Hospitality» are presented in Table 2.

Table 2. Distribution of contingent Distribution of admission in the areas of training as of 01.10.2016 in Russian Federation*

Data on the contingent of students	**43.04.01 «Service»**	**43.04.02 «Tourism»**	**43.04.03 «Hospitality»**
Applications submitted, pcs.	1173	3060	1142
Enrolled for the first year, including:	435	981	338
- Due to budgetary appropriations, people.	*312*	*738*	*220*
- with a full refund of the cost of training, people.	*123*	*243*	*108*
Competition, person / place	2,70	3,12	3,38
Number of students in all courses, including:	696	1924	561
- Due to budgetary appropriations, people.	*512*	*1341*	*368*
- with a full refund of the cost of training, people.	*184*	*583*	*193*
Of the total number of students, women,%	67,10	74,43	76,47
Expected release in 2017, people.	177	623	190

* Ministry of Education and Science of the Russian Federation

In the areas of Master's preparation, the average competition in 2016 was 3.06 people per seat. The total number of applications submitted is 5 371 people, which is 4.4 times higher than in 2013. 1 754 people were enrolled for the first year of the Master's program, 56% of them preferred training in the direction of 43.04.02 «Tourism», which practically coincides with the results of admission in 2014-2015. Due to a relatively high set of students, the direction of 43.04.02 «Tourism» annually maintains a leadership position in the number of students in all courses of study for three years. The absence of a coincidence of the results of admission to the master's program and the graduation in the relevant areas of the baccalaureate in 2016 is explained by the following:

- the students of the earlier years of the undergraduate studies under consideration could be enrolled in the Master's program;
- choice of master's programs of directions 43.04.02 «Tourism», 43.04.01 «Service», 43.04.03 «Hospitality» was made by graduates - bachelors of other directions, for example, directions of the economic block.

The effectiveness of the implementation of the OOP of the considered areas for the preparation of bachelors and masters on the criterion of «employment of graduates» is not possible to estimate, since there are no official data on actual output and employment.

In the regional aspect, the implementation of the programs of the directions for the preparation of bachelors and masters, the experience of the Perm region in which the development of tourist and recreational activities is one of the priorities of socio-economic policy is interesting. In the Perm region there are universities that implement some areas of training bachelors and masters for the tourism industry. It should be noted that these educational institutions are the leading universities in the Perm Region: FSBEI HE «Perm State National Research University»; FSBEI HVE «Perm State Humanitarian and Pedagogical University» and FSBEI HE «Perm State Academy of Art and Culture». Below is information on the training of bachelors and masters in the universities of Perm region in different question areas (see in Table 3).

Table 3. Information on the preparation of bachelors and masters in the field of tourism Universities of the Perm region as of 01.10.2017

Parametr	FSBEI HE «Perm State National Research University»	FSBEI HVE «Perm State Humanitarian and Pedagogical University»	FSBEI HE «Perm State Academy of Art and Culture»
Directions of training bachelors (profile)	43.03.01 «Service» (Social and cultural service) 43.03.02 «Tourism» (Technology and organization of tour operator and travel agency services)	43.03.02 «Tourism» (Technology and organization of sports and health services)	43.03.02 «Tourism» (Technology and organization of tour operator and travel agency services)
Directions for training masters (profile)	43.04.02 «Tourism» (Designing of tourist-recreational complexes and management of them)	no	no
Forms of training	full-time / correspondence	full-time	full-time / correspondence
Availability of places financed from the federal budget (in the PCC for 2015)	in each area of training bachelors and masters	no	each direction
The cost of training in the first year in	Full-time education (bachelor's program) -	Full-time study – 101 000 rubles.	Information about the cost is absent.

the 2015-2016 academic year	111 700 rubles. Correspondence form of education (bachelor's program) – 56 400 rubles. Information on the cost of a master's degree is absent	Correspondence form of training – 40 000 rubles.	

* Official page of: FGOUU V PGAIK; FBGUU V «PSPU»; FBGUU V «PGNIU»

The direction of training bachelors 43.03.02 «Tourism» is implemented by the three leading universities in the Perm region, students can choose either full-time or part-time form of education. In the FSBEI HE «PGNIU» the reception is carried out to the places financed from the federal budget of the Russian Federation. The cost of training in universities in the first year in the 2017-2018 school year in full time form of training in the FSBEI HE «PGNIU» is 111 700 rubles. The average monthly accrued wages in the Perm region in May 2017 amounted to – 31 204.9 rubles, which indicates that the cost of training exceeded the average level of wages in the economy by 1.3-3.6 times (Central statistical database of the Russian Federation...). As entrance examinations, universities consider the results of the Unified State Exam on Russian language, social studies, mathematics or history. Each direction of training bachelors and masters includes training on one profile. Direction of training bachelors 43.03.01 «Service», implemented in FSBEI HE «PGNIU» is represented by the profile «Socio-cultural service». In the direction of the preparation of bachelors 43.04.02 «Tourism» provides training to three institutions of higher education of the Perm region (see the list in Table 3). FSBEI HE «PGNIU» and FSBEI HE «PGNAIK» carry out preparation of bachelors on the profile «Technology and organization of tour operator and travel agency services». In addition, the FSBEI HE «PGNIU» has opened a reception for the direction of training masters 43.04.02 «Tourism» profile «Designing of tourist-recreational complexes and management of them». FSBEI HE «PGGPU» by the faculty of the faculty of physical education the preparation of bachelors of the direction 43.03.02 «Tourism» on the profile «Technology and organization of sports and health services» is carried out. The direction of training bachelors and masters 43.03.03 «Hospitality» is not implemented by any university in the Perm region, however, according to experts (Bainov, Vichkanova, 2010; Vetitnev et al., 2014; Kruzhalin, 2016), the labor market has a shortage of qualified personnel in the field of hotel management and service.

At present, the resort complex of Perm region gradually achieves a positive dynamics in the growth of performance indicators. According to preliminary data of Rosstat in 2015, the number of RMS in the Perm region was 38 organizations (official statistics for 2016 are absent). In 2015 the CCM of the Perm region fulfills the principle of self-sufficiency (the operating profit amounted to 126.4 million rubles), and 21.8 % of vacationers account for the share of sanatorium-resort organizations among the entire tourist flow. In 2017 growth is expected due to the popularity of recreation within the region and the implementation of the regional program «Tourism Development» approved by the resolution of the Government of the Perm region № 80-p of February 14, 2014 (Permstat...). The sanatorium and resort complex of Perm region, similar to the regional tourist and recreational area, suffers from a shortage of personnel with professional knowledge in the field of organization of activities, management and control. All this speaks about the need to create on the basis of the directions the preparation of an educational program (profile) for the organization of the resort business, the purpose of which is to satisfy the needs of the sanatorium complex in highly qualified personnel.

As a recommendation to the developers (FUMO in the higher education system of the UGSN «Service and Tourism»...) of the educational program on the direction of 43.03.02 «Tourism» on the basis of the analysis, the following is stated:

- in the list of objects of professional activity (or field of knowledge) it is necessary to introduce a sanatorium-and-spa service, which, despite being a part of the tourism product, has a significant specificity, which manifests itself in a combination of methods, treatment, rehabilitation and rehabilitation, the implementation of which is entrusted to sanatorium and resort organizations, with methods and methods ensuring achievement of commercial and social effects;

- the formulation of some professional competences within the framework of technological activities must be supplemented from the standpoint of the technology of sanatorium-resort activity;

- the material and technical support of the educational program must necessarily include the establishment of training centers on the basis of the leading sanatorium and resort organizations, within the framework of the partnership interaction between the educational institution and the organization.

3. Conclusions

In conclusion, we can draw the following conclusions.

1. Applicants of Russian universities show a high interest in the areas of training bachelors and masters «Service», «Tourism» and «Hospitality» and this is evidenced by the data of the competition upon admission.

2. A significant number of places in Russia's higher education institutions in the areas of bachelor's and master's training considered above are financed by budget appropriations of the federal budget.

3. The direction of bachelors' preparation «Hospitality» should be included in the list of directions implemented by the universities of Perm region in order to improve the quality of hotel services in the region.

4. Recommendations are formulated on the development of educational programs of the direction of 43.03.02 «Tourism» from the position of development of the sanatorium-and-spa complex.

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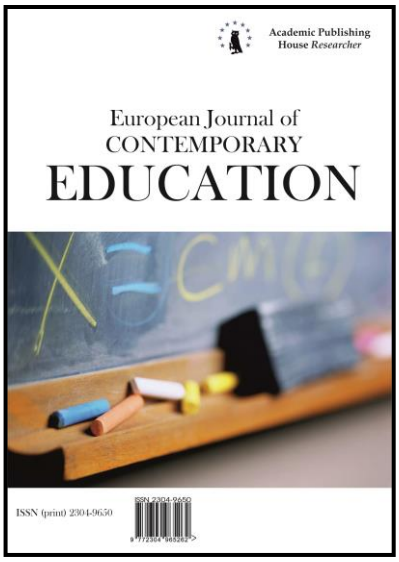

Social Factors of Mental Well-Being Violation Among High School Teachers

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Abstract

Social factors are considered which affect the mental well-being of high school teachers. The impact of such factors as the organization of scientific and research activity, working conditions, career and professional growth opportunities, the wage system, and the organization of a workplace are analyzed. The survey was conducted among the professors and teachers of leading Russian universities (N = 295). The study used an adapted questionnaire of subjective assessment concerning the social-psychological context of a high school teacher work, developed by A. Mayer on the basis of the organizational condition study methods, work satisfaction and professional development. The received materials were supplemented and concretized in the course of the focus group study, which allowed to identify psychologically vulnerable groups of teachers. Confirmatory factor analysis of social conditions, in which the professional activity of pedagogical personnel was carried out, showed that the confidence in the long-term guarantees of labor activity and the stability of scientific research work indicators are the strongest predictors of the mental well-being among pedagogical personnel. The results of the study made it possible to identify the following factors among the social factors that have a special weight in the processes of a mental well-being disturbance among teachers: the transfer of scientific and pedagogical workers to an effective contract; the increase of their scientific and teaching activity pace, burdened by the unpredictability of management requests; the disadvantages of a training schedule drawing up, etc. They determined that a significant influence of the motivational profile shortcomings, singled out as the part of social factors, provokes the following violations of the mental well-being among teachers: the violation of the value unity in a team; a stable domination of negative emotions; alienation, hiding uncertainty in their abilities; the deformation of mutual assistance systemic nature; increased anxiety and proneness to a conflict among university teachers. These studies

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support the hypothesis that a high degree of teaching work intensity, a high emotional, psychological and sensory loads, which are the consequence of a number of social factors negative influence, make a significant impact on the psychological-emotional state of high school teachers, including professional burnout.

Keywords: mental well-being, social factors, higher education institutions, teachers.

1. Introduction

Nowadays, modern high school is in the center of social and economic reforms aimed at intellectual and human potential development. The leading role of a modern high school is in the course of these processes. It actualizes the need to find new approaches in order to ensure the mental well-being of teachers.

The professional activity of higher education teachers has its own specifics, which allows to assign it to a group of occupations with a large number of stress factors and persistently high risks of psychological and emotional health disruption among workers. This is accompanied by a number of professional and personal deformations (Mariychuk, 2016; Vinichenko et al., 2016; Pirincci et al., 2008). The scholars engaged in the study of professional health among university teachers pay attention to the fact that "the frequency of stress conditions, low stress-resistance and frustration tolerance of pedagogical personnel is much higher in comparison with the experts of other social groups" (Nikiforov et al., 2015).

The results of emotional and psychological health study among high school teachers show that teachers, as a professional group, are characterized by extremely low rates of physical and mental health, with a tendency of their decrease with the growth of pedagogical experience (Lisnyak et al., 2012; Petanova, 2011). Besides, a significant part of the teaching staff at Russian universities has a high level of emotional tension, caused by a low degree of satisfaction with the set of conditions in which their professional activities are carried out (Rogach et al., 2016). This circumstance is manifested in the reduction of teacher mental functions stability, their poor emotional well-being and in a significant decrease of working capacity.

The health of pedagogical staff at high schools in its psychological and physiological aspects is the topic of a research that has a long history, and the interest to it is heated periodically by publications in which a critically high level of professional burnout is revealed among university teachers. However, a high relevance of this work is conditioned by the fact that most of the studies focus the attention on the influence of psychological factors, on the processes of mental well-being disruption among pedagogical staff, while the dependence of the psychological-emotional states on the organizational features of a working environment among university teachers was studied poorly. In such a situation, the issue of all social factors identification in the mental well-being of university teachers is particularly acute: its solution is important for the development of a long-term personnel policy aimed at the selection and retaining of scientific and pedagogical personnel at higher education institutions, as well as at Russian high school world status raising.

Our study was carried out on the basis of Russian Federation higher educational institutions. The aim of the work is to study the dependence of the mental well-being among university teachers on the organizational features of a working environment. We studied the social context of pedagogical staff work, based on the study of organizational conditions, job satisfaction and the professional development of a high school teacher. A particular emphasis in the work is on the determination of the dominant psychological emotional states of university teachers, depending on the social conditions of a working environment, including the analysis of the relationship between the mental well-being of university teachers and the degree of their subjective satisfaction with the organizational characteristics of the working environment. The performance of confirmatory factor analysis made it possible to establish a set of social conditions and the groups of social factors that have a special weight in the processes of the mental well-being disruption among university teachers.

The problem of mental well-being among teachers

The issues of a person mental well-being are at the center of scholar research attention since the second half of the 20-th century, which made it possible to determine several approaches to this phenomenon understanding. A hedonistic approach involves the study of surrounding reality perception by a person from the standpoint of personal benefit and pleasant experiences (Bradburn, 2014). Within the framework of this approach, the "mental well-being" of a person is

understood as his positive experiences, conditioned mainly by external influence factors (Kahneman, 1999; Diener et al., 2012). The structural reflection of mental well-being rests on the structure represented by the meaning of life, the satisfaction with life conditions and social interaction. It was determined that these three trends stipulate the dominance of positive emotions, which is determined by the very existence of subjective well-being (Chan, 2009).

The eudemonistic approach is based on the consideration of mental well-being as the result of personal development (Waterman, 2008; Ryan et al., 2001). Noting the limitations of the hedonistic approach in the study of psychological well-being phenomenon in this case, the researchers shift the emphasis to a person positive functioning. A person transforms the surrounding world transforming himself and thereby achieves harmony. In particular, C. Ryff identifies six main components in his theory of mental well-being: self-acceptance, positive relations with others, autonomy, environmental management, purpose in life, personal growth (Ryff, 1995).

Today one can state a great variety in the definition of a person mental well-being concept and structure, as well as the factors that cause his possible deviations (Tarabrina et al., 2012; Shamionov, 2014; Shevelenkova, 2005; Artyukhov et al., 2015). At that, the category of "attitude" is the basis to consider the concept of "mental well-being" for most researchers.

According to this provision, the mental well-being of a high school teacher personality is viewed as an intrapsychic phenomenon, the components of which are: the attitudes toward oneself (the assessment of personal and career growth), the attitudes towards others (the evaluation of interpersonal communication character and quality) and the attitude to the conditions of their professional activity (satisfaction with working conditions).

The quality of university education depends to a large extent on the key figure of the educational process – a university teacher, and not only on his professional competence, but also on physical and psychological health (Fitzmaurice, 2010). The profession of a teacher is associated by itself with the intensity of interpersonal communications and a high emotional involvement in these communications. In this regard, the probability of professional-personal deformation and emotional burnout is very high (Zausenko, 2012). The thesis of "emotional labor" is introduced in a number of studies, which made it possible to bring the analysis of legitimization process to the forefront concerning the emotions of teachers and their consolidation in the work cycle. It is argued that emotional picturing creates a kind of space for a teacher that determines the recognition of ambivalence in relation to a profession (Kitching, 2009).

Developed countries are characterized by the studies that examine the well-being of teachers in a social-political context, which makes it possible to establish the relations between education and well-being, as well as between poverty and education (Winter et al., 2016). However, the concentration of research attention on the "role of demand for jobs and resources to work in the field of pedagogical well-being" does not allow to reflect specific situational requirements (Bermejo-Toro et al., 2016). The need to balance the individual and institutional well-being through innovation and sustainable partnerships is highlighted separately (Margolis et al., 2014).

A special attention was paid to the interconnection of social conditions and health among the workers of an educational organization (Miglioretti et al., 2013; Johnson et al., 2003). Part of the works is devoted to the education quality improvement through the optimization of working conditions (Waterson, 1946; Feigenbaum, 1994; Li, 1991). Recently, the studies concerning the creation of favorable working conditions during a part-time work (Wharton and Blair-Loy, 2002) and the struggle against stress during work (Barck-Holst et al., 2015; Kyriacou, 2001) are the relevant ones.

According to the studies of South Africa teacher mental well-being, the conclusion was made on the presence of protective factors that mediate the impact related to stress-factors operation. According to the study results, it is concluded that, in spite of the high level of stress among teachers, those who have a high restorative capacity, demonstrate a high level of mental health more than others (Boshoff et al., 2014).

At the same time, despite a considerable interest in this issue, there is no comprehensive study nowadays concerning the dependence of psychological-emotional states of university teachers on the organizational characteristics of a working environment. Besides, the vast majority of such studies were conducted using the data from North America, Europe and Asia. We were not able to find any studies using Russian material.

2. Methodology

The aim of the study is to determine the social factors affecting the mental well-being of university teachers, as well as their value in the processes of psychological-emotional state disruption. The impact of such factors as the organization of research and training activities, working conditions, career and professional growth opportunities, the wage system, and the organization of a workplace are analyzed.

The starting point is the hypothesis that the high degree of teaching work intensity, a high emotional, psychological and sensory loads that arise as the result of a number of social factors (the organizational features of a working environment) negative influence have a significant impact on the mental well-being of university teachers. The implementation of training activities in the conditions of non-compliance with safety requirements and sanitary and hygienic standards of a workplace organization, an inappropriate planning of a training load, and also the active influence of other social factors contributes to the emergence of stress, which ultimately leads to a teacher's performance decrease and "professional burnout".

The empirical results of the study are based on the data collected at Russian higher education institutions in 2016. The sample includes the representatives of professors and teachers from leading Russian universities (N = 295) of various specialties, aged from 22 to 70 (an average age is 47.80 years, median is 47 years, standard deviation makes 3.70), including 132 men (44.7 %) and 163 women (55.3 %), which is adequate for the gender composition of people involved in pedagogical activities at universities. 13.2 % among them are without a degree, 58.3 % are the candidates of sciences, 28.5 % are the doctors of sciences, which allows to study the mental well-being of various categories of university teachers. The participants filled-in the questionnaire as the part of an online survey.

An adapted questionnaire was used as the part of the research toolkit to assess the social-psychological context of a high school teacher work, which was compiled on the basis of the "Methodology for organizational condition study, the satisfaction with work and the professional development by A. Mayer". The questionnaire serves to diagnose organizational conditions, the satisfaction of teachers with work and their professional development by the evaluation of the objective characteristics of all social conditions and the subjective perception of a working environment characteristics. The units included in the questionnaire were adapted according to the purpose and the objectives of the study. The following units are used in the questionnaire: colleagues/head, research and training activity, working conditions, career growth and professional development, wage, the organization of a workplace, etc.

The task of this tool validation as a whole was set, for which the materials were supplemented and concretized during the focus group study.

The results of the study were analyzed by the conduction of the dependence analysis concerning the mental well-being of high school teachers on their subjective satisfaction with the organizational characteristics of a working environment and the use of the counting method for the Pearson's criterion X^2.

3. Results and discussion

The modern trends of higher education development presuppose the identification and the consolidation of key areas to increase the effectiveness of the university teaching staff by the transfer of scientific and pedagogical workers to an effective contract the period of which makes 1 – 5 years. At the same time, according to the received results, 87.1 % of the respondents concluded a one-year contract. In the opinion of 26.8 % of teachers, the introduction of an effective contract motivates them to increase the pace of personal and professional development, and 13.6 % of respondents talk about the possibility of a more precise trajectory development for their career growth.

At the same time, according to 54.6 % of teachers, the introduction of an effective contract provides a psychological tension increase among teachers. In connection with the innovations, there is a competition increase between teachers for vacant jobs, which was noted by 64.7 % of respondents. 56.3 % of teachers note the development of an anxious state in connection with the need for an annual competition concerning their position (the fear of being fired); 39 % note a growing distrust in the actions of the heads. In the opinion of almost half of the teachers, the annual term of the contract does not allow to ensure an organizational commitment of employees

in the long-term, which causes the emergence of a chronic stressful work environment, and also contributes to a psychological destabilization and increased tension in the relations of teachers and university management.

This situation correlates with the studies of other authors who, on the basis of similar data, conclude the following: the presence of an affective commitment to an organization makes a positive influence on the mental well-being of teachers, while its absence becomes the factor in its destabilization (Inerney et al., 2015).

It is established that 64.7 % of university teachers talk about the pace of their research activities increase, which results in emotional fatigue increase, reinforced by the uncertainty in their ability to achieve specified indicators. At the same time, the assessment of an emotional state among teachers also proves the presence of a number of positive aspects. So 26.8 % of teachers feel a sense of recovery from the opportunity to improve their professional level; 38.6 % note the growth of their intellectual and social activity; 35.7 % of teachers talk about the emergence of new professional interests.

Almost 29.8 % of teachers feel full satisfaction from the quality and the effectiveness of their professional activities. It is noteworthy that the feeling of satisfaction and interest arises in them not because of a qualified audit work (the work with students), but due to the achievement of planned scientometric indicators, their high publication activity, etc. At that, 64.7 % of respondents noted the occurrence of a cognitive dissonance between their identification as a teacher and the requirements of the current system of the work evaluation among professors and teachers by the results of scientific activity. "The disregard for the development of professional identity causes damage, even for those who conduct scientific work, because the landscape of modern science transformed" (Hancock, Walsh, 2016).

Most teachers note the existence of a relationship between the quality of classroom activities and the orientation to the research component of their professional activity. In the course of the focus groups, the following provisions were established: "the lack of time for the preparation of classes", "the discomfort during the conduct of classes due to insufficient study of educational material", "the fear of additional questions from students", etc. Thus, the teachers noted their vulnerable position on this issue.

According to the obtained results, young teachers without a degree are at the greatest risk zone in terms of the mental well-being. They have difficulty in with the entering a research team and/or do not have a base to develop their research capacity. As well as teachers of the older age group (60 years and older), most of them are not able to support the set high rates of scientific and research work any longer ($X^2 = 7{,}679$, $f = 2$, $p < 0{,}05$).

Table 1. Psychological tension of teachers among different age groups (N=295)

	Teachers experience psychological tension			Teachers do not experience psychological tension		
	men	women	total	men	women	total
Young teachers under 30 without a degree	20	41	61	7	8	15
Teachers at the age from 30 to 60 years with a candidate of sciences degree, Ph.D.	41	67	108	36	25	61
Teachers over the age of 60 with a candidate of sciences degree, Ph.D.	23	15	38	5	7	12

According to the assessments of teachers who do not have an academic degree and who are at the beginning of their careers, the lack of a systematic support for "young experts" becomes a significant factor of their mental well-being disruption, who feel excluded due to this circumstance from the "context" of developed small groups. It is noteworthy that this provision is typical for university teachers and other developed countries. Despite the fact that there are practically no studies concerning the social component of a teacher's activity, nevertheless, a high correlation is established between the availability of information and the emotional support for young teachers by their colleagues and the emergence of various burdens in psychological well-being (Väisänen et al., 2017).

During the focus group study this category of respondents noted: "the sense of detachment", "uselessness", "too much workload", "confusion from the discrepancy between their expectations and the real situation", "you feel tired from the fact that you need to prepare for classes, write a dissertation, publish articles, participate in educational work and much more". Young experts pay a special attention to the presence of barriers on the way to their career growth, which is seen as a significant factor in psychological and emotional state destabilization. In the course of the focus group they noted that "the scientific team does not perceive a recent student as a real colleague, seeing in them those who still need to study more and more", "a young expert is a future competitor for old workers", "there is no real support during a thesis discussion, rather an aggressive rejection", "an unequal treatment of newcomers".

In its turn, due to a number of psychological-physiological features aged teachers have a low adaptive capacity for changes which a high school experienced: the assessment by scientific and metric indicators, electronic training systems, the development of electronic content, etc. Most of the interviewed teachers (78.4 %) noted the caste nature of teachers within this age category, describing them as "old-timers" for whom general rules are not applied, and 70.3 % of respondents noted their reluctance to accept the objective changes in the attitudes of national higher education.

Due to the developed situation, the comments made by age teachers during the focus groups are of particular interest. In particular, they noted "a sense of authority loss" and "the loss of personal and professional positions". The transition to a quantitative assessment of labor contributes to "the development of complexes", "feelings of insecurity" and "the loss of soil underfoot" among them. Often the following saying goes in one interpretation or another: "Nowadays everything is measured by Hirsch index and the number of Scopuc publications..., which nullifies all my pedagogical and scientific experience at once". According to the assessments of teachers of the older age group, the greatest threats to their mental well-being disruption are represented in the following areas: the increase of scientific and methodological burden (78.6 %), the introduction of labor efficiency evaluation by scientific and metric indicators (85.5 %), a high amount of work in an electronic medium (79.3 %).

It is noteworthy that this situation was not typical for the aged teachers of the developed countries 15-20 years ago. According to the studies, the level of well-being among elderly teachers was quite high, although 36 % of teachers had a number of health-related disorders. However, according to the efficiency index, only 4 % of 45-49-year old and 12 % of 55-59-year old teachers were classified as those who have low working capacity (Kinnunen et al., 1994).

Undoubtedly, the approach of the leadership to the evaluation of scientific and pedagogical work is a significant social factor that has a significant impact on the mental well-being of all teachers. As it was already mentioned above, the transparency of teachers' labor evaluation according to scientific-metric indicators is ensured at the current moment. Despite the fact that 87.3 % of respondents evaluate the "the timeliness and the amount of wage payment", 38.7% of teachers note the shortcomings of the most quantitative approach to their work evaluation. In their opinion, the qualitative content of teacher research activities is lost due to the desire to achieve high scientometric indicators (which is represented by international practice). The relevance of these problems is also emphasized in other studies. Ranking systems and the stimulation of publication activity lead to "distorted" pseudoscientific activity, without taking into account the social value of this activity.

Nevertheless, the study found an increase of teachers' interest for additional payment receiving in comparison with the previous period. As a negative point, one can note that every second respondent lacks the confidence in the stability of a set co-payment system, its invariability in the direction of indicator increase during the achievement of specified indicators.

At the same time, the general assessment of "my boss" unit by the teachers according to A. Mayer's methods some positive characteristics prevail. Almost 47.8 % of respondents note the satisfaction with the actions of the current leadership. In their description, they relied on the following adjectives: "active", "attentive to trifles" and "initiative". However, during the performed study they also found that pedagogical staff has some vigilance to the actions of their management: the respondents are particularly displeased with the leveling of their professional achievements by their superiors; There is the absence of obligations to follow the "verbal" arrangements of the management with the teachers; Some of the teachers noted the unpredictability of management requests and the fragmentary growth of an unplanned load. In the opinion of the respondents this circumstance contributes to the collision of interests among teachers in the process of their professional function implementation. The result of such a collision is the violation of the value unity in the collective and the deformation of mutual assistance systemic nature.

The planning of a schedule ($p<0.05$) is also referred to significant organizational features of the working environment. According to the study results, a significant number of teachers (33.2 %) experiences a high level of anxiety before a semester start because of a training schedule planning, as they worry that their wishes will not be taken into account. The level of stress is much higher among young teachers (80.1 %). A high "intensity of work" to some extent marked by each teacher acts as a weighty factor that has a negative impact on the mental well-being of teachers. In the opinion of the respondents, this circumstance is conditioned by the significant volume and uneven distribution of the pedagogical load during an academic year.

A desired "working condition" for each teacher is a "convenient" schedule, which would allow him not only to minimize possible loads (emotional, psychological and physical ones), but also to carry out his professional activities at a higher level, including through the participation in scientific projects, grants, scientific conferences, the management of student circles, etc. However, the overwhelming majority of respondents (51.2 %) are not satisfied with their work schedule or are partially satisfied, which makes the schedule of class optimization issue as the most relevant one for many teachers. A part of the teachers (20.1 %) drew attention to the fact that several disciplines can be scheduled within the same day, "making it difficult to prepare for a lesson, dissipating a teacher's attention and increasing his fatigue".

As practice shows, one of psychological destabilization zones for university teachers is represented by their "workplace". According to the obtained results, this characteristic of social conditions was appreciated highly for the most part. 56.6 % of respondents are satisfied with the organization of a recreation area for teachers, which fully meets the need of employees to "keep educational documents in a workplace" (47.5 %), "to keep personal belongings" (46.2 %), "in a favorable atmosphere for rest and for an academic lesson preparation" (44.8 %). Based on the obtained results one can conclude that teachers pay a special importance to the technical equipment of a workplace, which would allow to maintain a high level of their professional activity ($p<0.05$).

So, 67.6 % of teachers note the satisfactory provision of resources concerning their workplace, emphasizing their attention on the possibility to use computer and office equipment fully for purposes related to the educational process.

At that, 36.4 % of respondents pay attention to the need of their "working needs" harmonization concerning the use of various technical and multimedia means with colleagues, which exacerbates sometimes the teachers' already encountered contradictions and provokes them into an open conflict in an attempt to defend their interests. According to the results of the study, it was established that most often conflict situations between teachers are developed due to the following conditions: "personal dislike" – 12.5 %; "In the course of organizational issues solution" - 13.9 %; "Because of a high training load, an uncomfortable schedule, etc." – 11.2 %. Annual competitive procedures and the reduction of rates at the departments contribute to the emergence of tension in interpersonal and professional relations of teachers ($p<0.05$). For example, 37 % of respondents noted that they began to notice "a sense of rivalry" when they communicate with colleagues, 9.2 % experience "envy", 5 % feel "irritability" and 13 % have the sense of "injustice". A high competition, which develops the disunity of the collective, the fulfillment of the set tasks not through a close cooperation, assistance, help, but through competition, and thus the collective is transformed into a group of people consciously leveling interpersonal social contacts.

The evaluation of a social context motivational profile within the professional activity of pedagogical staff testifies to the actualization of the following needs of teachers at Russian universities:

- the need of their merits recognition;
- the need for a sense of relevance as a high-class specialist;
- the need for a clear organization of working time;
- the need for long-term guarantees concerning a workplace stability;
- the need for the fair payment of their labor;
- the need for personal and career growth.

4. Conclusion

In the course of the performed study, the dependence of psychologic emotional states among university teachers on organizational characteristics of a working environment was determined. Confirmatory factor analysis of social conditions in which the professional activity of pedagogical personnel is carried out showed that the confidence in the long-term guarantees of labor activity and the stability of scientific research work indicators are the strongest predictors of the mental well-being among pedagogical personnel. The most psychologically vulnerable groups of teachers (teachers without a degree and aged teachers) who have a low adaptive capacity for changes to which a higher school has been subjected are the most influenced ones by social factors.

Almost half of university teachers talk about the pace of their research activity increase, which results in an emotional fatigue increase, reinforced by the uncertainty in their ability to reach the set indicators. In the course of the performed study, it was found that pedagogical staff has some vigilance to the actions of their management, caused by the unpredictability of inquiries from their superiors and the fragmentary increase of an unplanned load.

The results of the empirical study showed a high degree of some teachers' dependence, who negatively assess the level of their mental well-being, on the degree of their subjective satisfaction with the organizational characteristics of a working environment. According to the information received, the social factors that have a special weight in the processes of the mental well-being disruption among teachers include the following ones: the transfer of scientific and pedagogical workers to an effective contract; the increase of their scientific and teaching activity pace, burdened by the unpredictability of management requests; the shortcomings in a training schedule planning, etc. It was determined that the introduction of an effective contract provides a psychological tension increase among the teaching staff of universities, initiating the emergence of a chronic stressful work environment, the development of anxiety, psychological destabilization, the feelings of frustration and uncertainty in the future among teachers. The conclusion is drawn that the significant influence of the motivational profile shortcomings identified in the composition of social factors provokes the following violations of the mental well-being among teachers: the violation of value unity in a team; a stable domination of negative emotions; alienation, hiding the uncertainty in their abilities; the deformation of mutual assistance systematic nature; an increased anxiety and disposition to a conflict among university teachers.

These studies support the hypothesis that a high degree of teaching work intensity, a high emotional, psychological and sensory loads, which are the consequence of a number of social factors negative influence, make a significant impact on the psychologic emotional state of university teachers up to a professional burnout.

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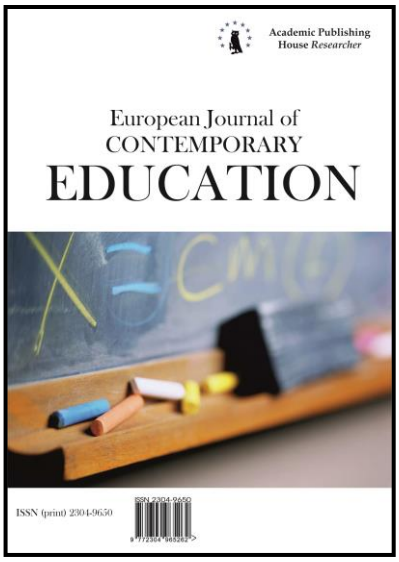

Scenarios for Chemistry Teacher Training and Practice in Romania in 2030: Views of Chemistry Students

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Abstract

Four scenarios regarding Chemistry teacher training and practice in Romania in 2030 were developed by using the 2x2 matrix design for scenario writing. The two driving forces taken in account for the design of scenarios were migration and consumerism. In two of the proposed scenarios teachers are trained to teach socioscientific courses at class. One aim of this study was to collect Chemistry students' views on the developed scenarios for Chemistry teacher training and practice in Romania in 2030. From the N=111 students tested, 51.35 % of students selected the most auspicious scenario as the scenario for teacher training and practice in 2030, a scenario which did not include teaching socioscientific courses at class. This result was confirmed to be statistically significant by the Kruskal-Wallis test ($p<0.01$) and the Mann–Whitney *U* test ($p < 0.01$). This made us wonder if the students are aware of the consequences in time of migration and consumerism and if a more comprehensive study was necessary, to identify the predictors for their selection of scenarios.

Keywords: Chemistry education, Chemistry teacher training, ESD, STSE, Education, scenarios.

1. Introduction

Forecasting scenarios in education: the Romanian landscape

Organization for Economic Co-operation and Development (OECD) started the Futures project in 2000, to forecast future in education (OECD, 2000). The University Futures project was created with the aim to pinpoint the recent changes in the educational arena, to find the trends,

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to offer space for strategic reflection on Higher Education (HE) system and not ultimately, to create scenarios for HE to 2030. For the development of future scenarios were taken in consideration six major themes, with the following associated questions to be answered (OECD, Centre for Educational Research and Innovation (CERI) - University Futures, n.d.):

Demographics – would HE system be restructured because of reduced population of students and associated lower budget?

Information and communication technology (ICT) – how ICT would influence HE? Would provide more access and reduced costs?

Globalisation – how is mobility of students, academics and programs affect HE policies? In this context, how would HE institutions deal with international competitions?

Market and quasi-market forces – how will market influence the HE system? The fact that HE are becoming more and more demand-driven would mean that the teaching and universities' mission would be changing?

University research – would the research be pursued in the future only at a restricted number of universities? To what extent would computing and internationalisation afect academic research? Would the link between teaching and research be still existing in the future?

Labour market demand – how woukd changes in economy and labor market influence the organisation of HE system?

Reserach in the field of HE scenario writing have flourished in the last years, Eur J Futures Res offering a topic series of Education in 2030, and other articles on futures education were published in Journal of Futures Studies or Futures. However, a review of articles in this field is not the aim of this paper. A limited number of scenarios regarding education in Romania were developed. Andreescu et al. (2012, 2013) have developed four university scenarios in Romania of 2025. The Delphi method was used and the academic community from Romania was involved in the development of scenarios. The five thematic areas for development of scenarios were: the development of human capital, knowledge genaretion, relationship with business and the community, social values, and international competitiveness. The four scenarios were not conceptualised as being alternative to one another, but as partly overlapping foresights of the future. The four scenarios were: the university of life and work (the university is providing its students with skills necessary for life and emplyement), the knowledge constellation (the knowledge is accesible and ubiquitous, and universities are the places where knowledge is created and scrutinized), the athenaeum (the HE system is higly regarded by both society and government, and the students are prepared at universities to face the market requests), and the blue ocean (there are three archetypes of universities: internationally-renewed universities, entrepreneurial universities and vocational universities). Iucu et al. (2013) have developed scenarios for the training of mentors who would be mentoring beginning teachers. The authors have chosen three criteria for the development of scenarios: level of regulations, training providers and types of program. Two scenarios were proposed: a) a highly regulated, centralised scenario and b) a more flexible, low regulated system. The scenarios were developed by taking in account the local education, political and social issues. Maybe the next venture in developing scenarios for future education in Romania is to select punctual social issues around which to develop the scenarios.

The Romanian context: would migration and consumerism shape the future of education system?

Many strategies could be involved in scenario writing (Amer et al., 2013). The four quadrants matrix or the double uncertainty or 2x2 matrix approach uses two criteria or driving forces which would shape the future. These two criteria are considered to be the most important and the most uncertain factors. Scenarios are developed in each of four quadrants of a grid, the scenarios being written around the two driving forces. Considering the fact that it is well known that migration and consumerism are two important issues which affect the entire globe (OECD, 2008 and Taylor et al., 2015), these were considered the two societal driving forces for scenario writing in this study. According to the data issued by the National Institute of Statistics in Romania (Sustainable Development Indicators in Romania (SDIR), n.d.), the resident population of Romania decreased from 21.52 million of people in 2004 to 19.87 million people in 2015. The declin of population number in Romania has three factors: international migration, low number of births, and mortality (Migration, n.d., 2014). The consequence was aging of Romanian population habitating in

Romania: the average age of residents in Romania has increased from 37.8 years in 2002 to 40.9 years in 2013. A large percent of the emigrants are people with the age between 25-64 years. This percent increased over the time: this class of people (age 25-64) was 74 % in 2012 and 65 % in 2002. (Migration, n.d., 2014). Metadata from the National Institute of Statistics in Romania (Sustainable Development Indicators in Romania (SDIR), n.d.) have shown that resource productivity increased from 0.67 (thousands of RON in prices of year 2010/ton) in 1994 to 0.80 in 2013. On the other hand, the domestic material consumption per capita also increased from 13.68 (Domestic Material Consumption / capita) in 1994 to 22.4 in 2013. The rate of recyclation of waste at municipal level increased from 0.29 % in 2003 to 13.21 % in 2013 to 13.07 % in 2014. Electricity consumption of hauseholds have also increased from 2004 to 2014 by 1.48 times. Average meat consumption per inhabitant have increased from 2000 to 2015 by 1.43 times. The development of scenarios around migration and consumerism topics would inevitably connote that the effects of present migration and consumerism would be recognisable in scenarios for education in 2030.

Implemeting the issues of Education for Sustainable Development (ESD), Science, Technology, Society, and Environment (STSE) Education into Chemistry Education

The idea of inclusion of education for susatinable development (ESD) in chemistry education class and in Chemistry teacher training is not new (see for examle Burmeister et al., 2012). The most common model for sustainable development involves a focus on sustainable development in areas such as ecology, economics and society (Burmeister et al., 2012). Implemenatation of principles of sustainability in chemistry field emerged as the twelwe principles of green chemistry: prevention, atom economy, less hazardous chemical syntheses, designing safer chemicals, safer solvents and auxiliars, use safer solvents and reaction condition, increase energy efficiency, use renewable feedstocks, avoid chemical derivatives, use catalysts, not stoichiometric reagents, design chemicals and products to degrade after use, analyze in real time to prevent pollution, minimize the potential for accidents (Anastas et al., 1998). Clearly, teaching and learning plain chemistry will not increase students' knowledge and ablities in sustainability area. Burmeister et al. (2012) proposed four models of implemeting issues of sustainable development into chemistry education: a) implementing the twelve principles of green chemistry in laboratory work, b) including the strategies for sustainability in chemistry education curriculum, c) addressing sustainability issues in scoio-scientific themes integrated in chemistry education, and d) chemistry education as part of schools development programes for ESD. Furthermore, it is considered that an important outcome of ESD is fostering competences for a sustainable future. Jegstad et al. (2015) developed a list of nine ESD competences: systems thinking, problem-solving, creativity, critical thinking, action competence, future thinking and belief, normative competence, communication and collaboration.

Inclusion in science curricula of issues regarding the connections between science, technology, society, and the environment (STSE Education) is also not a new trend in Science Education (Pedretti et al., 2011). The STSE education current emerged at the confluence of STS (Science-Technology-Society) current (for a description of STS current see Aikenhead, 1994) and environemntal issues. Ample research in the field of STSE education was pursued by Canadian researchers across the years. Two of the authors commited to undertake research in this field described the field in their publications:

At a macro level, STSE education situates science in rich and complex tapestry—drawing from politics, history, ethics and philosophy. It presents an opportunity to learn, view, and analyze science in a broader context, while recognizing the diversity of needs of students and classrooms. (Pedretti et al., 2011, pp. 618)

Although STSE education has focused students' attention on some significant potential social and environmental problems associated with fields of science and technology, including, for example, those pertaining to cell phone uses [...], climate change [...] and genetics issues [...], emphasis has tended to be restricted to making students aware of different stakeholders' positions and then encouraging them to develop reasoned arguments to defend their personal stances on issues. Much less emphasis has been placed on encouraging and enabling students to engage in sociopolitical action projects aimed at overcoming potential personal, social and/or environmental problems associated with fields of science and technology [...]. (Bencze, 2013, pp. 120)

The teaching strategies used in class to cover the STSE education issues are not typical for a science class and they are, for example: debates, simulations, and role-play (Pedretti et al., 2006). Furthermore, dealing with issues related to STSE education at class involves utilisation of higher-order cognitive skills by students, for example decision making (Zoller et al., 2012). It appears that teachers covering issues related to STSE education at class encounter a few problems: identity issues, issues regarding curriculum and its politicisation through STSE topics (Pedretti et al., 2006). Murray (2014) conducted a Delphi study to identify the views of 130 experts regarding the future of science education in Canaday. At the end of this study it was revealed that amongst the trends affecting science eduation in future at global level are: Science, Technology, Engineering & Mathematics (STEM), Science and Education for Sustainability, Science Education for Economic Competitiveness, Re-conceptualizing the Purposes of Science Education. Among the themes for the foundations of science curriclum in Canada were selected Science Education for Global Citizenship, Science Education for Sustainability, Science, Technology Society and the Environment (STSE). The panel of experts selected ESD and STSE as prioritar foundations for Canadian science education with a consensus level of 92.86 %.

To the best of our knowledge, no such futuristic studies were undertaken up to date for Chemistry or Science education in Romania. Teacher training and practice plays a key role in educating the future generation of professionals and citzens. The present initial teacher training system in Romania requires attendance to a psycho-pedagogycal module during Bachelor and Master studies. This module comprises both theoretical courses and teaching practice in schools and is described in detail by Salajan et al. (2017). Apart from courses of Green Chemistry, at this moment topics ESD and STSE are not embeded in compulsory curricula at Chemistry degree level in Romania. If ESD and STSE Education topics or courses would be included in Chemistry curricula at secondary and tertiarty degree level, this would demand changes in teacher training and science education. Education plays a pivotal role in achiving the transformation of society and in training the decision-makers, change agents and layman. Therefore, universities must provide programmes for initial and continous training of teachers and professionals to practice in the field of sustainable development (Dannenberg et al., 2016).

2. Aims and Research Questions

The first aim of this study was to develop four scenarios of teacher training and practice in 2030 in Romania, by employing the 2x2 matrix strategy for scenario development (driving froces: migration and consumerism). The next aims were to identify which scenarios were most frequently selected by students for education in 2030, from the sets of higher education scenarios developed by Andreescu et al. (2012, 2013) and from the sets of scenarios for Chemistry teacher training and practice.

RQ1: Which of the four scenarios of Chemistry teacher training and practice in 2030 is the most frequently selected by students?

H0: The values of mean ranks of options for Scenario A, Scenario B, Scenario C and Scenario D are equal.

H1: The values of mean ranks of options for Scenario A, Scenario B, Scenario C and Scenario D are not equal.

RQ2: Which of the four scenarios of higher education scenarios is the most frequently selected by students?

3. Methods

A 2x2 matrix scenario writing strategy was used for development of scenarios for Chemistry teacher training in 2030, using migration and consumerism as driving forces.

A number of N=111 students participated in this study, 77 participants from Babes-Bolyai University (Cluj-Napoca, Romania) and 34 participants from Al. I. Cuza University (Iasi, Romania), 93 female (83.78 %) and 18 male (16.22 %). All the participants in this study were enrolled at psihopedagogical module, to train for becoming a Chemistry teacher. After a brief discussion regarding ESD and STSE and the strategies for scenario development, the students were given the scenarios. The university scenarios used were the scenarios developed by Andreescu et al. (2013).

4. Results and Discussion

The 2x2 matrix used for scenario development is depicted in Fig. 1.

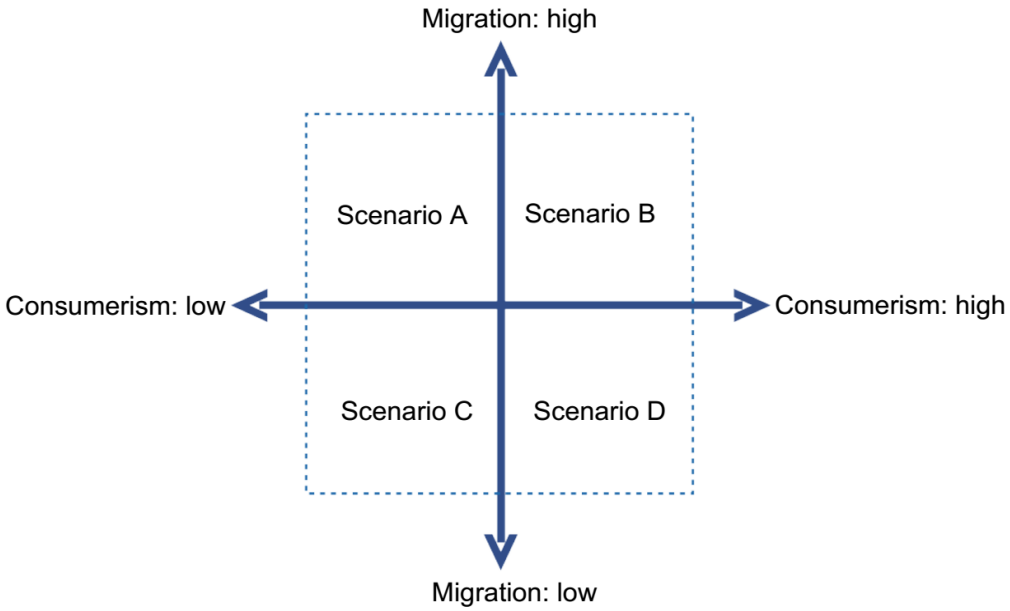

Fig. 1. 2x2 Scenario matrix, having migration and consumerism as driving forces

The characteristics of Scenario A (*Teacher / student ratio: 1 / 5*) are : low number of students, among students are students with parents working and living abroad, there are enough resources (energy, water, food, etc).

The characteristics of Scenario B (*No resources, no students*) are: low number of students, among students are students with parents working and living abroad, resources of all types are limited (water, energy, money, etc), people must use resources in a very careful manner, the society must be trained for sustainabile development, people must become aware of the consequences of their actions on environment, universities provide courses related to STSE Education.

The characteristics of Scenario C (*Prosperity*) are: normal number of students, the migration rate was reduced, there are enough resources (energy, water, food, etc).

The charcteristics of Scenario D (*Sustainability is a must*) are: normal number of students, migration rate was reduced, resources of all types are limited (water, energy, money, etc), people must use resources in a very careful manner, the society must be trained for sustainabile development, universities provide ESD courses.

The scenarios were developed and their content was adjusted after a focus group discussion with N=7 Chemistry master students. Full texts of scenarios are provided in Annex 1.

The most selected teacher training and practice scenario was scenario C (*Prosperity*), followed by B (*No resources, no students*), then scenario D (*Sustainability is a must*) and A (*Teacher / student ratio : 1 / 5*) (Table 1).

Table 1. Frequency of selected teacher training scenarios

Scenario	Count	Cumulative – Count	Percent	Cumulative – Percent
A	15	15	13.514	13.514
B	21	36	18.919	32.432
C	57	93	51.351	83.784
D	18	111	16.216	100

The scenario most frequently selected by students (51.35 % from N=111 students) was the most optimistic scenario, scenario C (*Prosperity*), in which both consumerism and migration levels were low. In Scenario C teachers did not prepare to teach socioscientifc issues at class. The Kruskal-Wallis test (N= 444) revealed that this result is statistically significant [H=14,096 at p =0,0028 (p<0.01)]. The values for sum of ranks and mean-ranks are depicted in Table 2.

Table 2. Sum of ranks and mean-ranks of options for Scenarios

Case	Condition	Valid - N	Sum of – Ranks	Mean – Rank
A	*Teacher/student ratio: 1/5*	111	23021,5	207,401
B	*No resources, no students*	111	22725,0	204,730
C	*Prosperity*	111	28889,5	260,266
D	*Sustainability is a must*	111	24154,0	217,604

The Mann–Whitney *U* test has shown that when the options for Scenario C are compared with the options for Scenario A, Scenario B or Scenario C, the null hypothesis is rejected ($p < 0.01$), the differences between the values of mean ranks are statsitically semnificative. However, when the comparisons are between the options for any two of the Scenario A, Scenario B, Scenario D, the null hypothesis is accepted ($p>0,05$), the differences between the values of mean ranks are not statsitically semnificative. The data regarding the Mann–Whitney *U* test are presented in Annex 2. The options for Scenario C (illustrated by the values of sum of ranks and mean rank) are dominant in raport with the options for Scenario A, scenario B or Scenario D. The proportion of options for Scenario C is statistically semnificative, the values for the non-parametric Kruskal-Wallis test (for global comparison) and Mann-Whitney U test (for comparison of options for Scenario C and any of other Scenario) being statistically semnificative ($p<0.01$).

The most selected university scenario was scenario B (*Knowledge Constellation*), followed shortly by scenario C (*Atheneum*) (Table 3). Both scenarios forecast a future in which university regains an important position in shaping the society.

Table 3. Frequency of selected university scenarios

Scenario	Count	Cumulative – Count	Percent	Cumulative – Percent
A	20	20	18.018	18.018
B	35	55	31.532	49.550
C	34	89	30.631	80.180
D	22	111	19.820	100.000

5. Conclusion

Scenario C (*Prosperity*) was selected by 51,35 % of tested students, this result being statistically significant (confirmed by the Kruskal-Wallis test and the Mann–Whitney *U* test, $p < 0.01$). This fact could make us speculate that the students did not internalise the perils of living in 21st century and that they are not aware of the consequences in time of migration and consumerism. However, a pertinent conclusion could be taken only after a more comprehensive study, to identify the predictors for students' selection of scenarios. Nevertheless, taking in consideration that the most optimistic scenarios were selected from both sets of scenarios (university scenarios and Chemistry teacher training and practice in 2030), it would be interesting to verify if optimism and personality traits could predict students' selection of scenarios (among other possible predictors).

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6. Annexes

Annex 1

Teacher training and practice scenarios in Romania in 2030

Select a scenario for teacher training and practice in Romania in 2030.

Scenario A: *Teacher / student ratio: 1 / 5*

Teachers' practice in schools:

Many Romanian people have migrated to work abroad, some of them toghether with their children. The number of students is very small (*e.g.*, 5 students in a class) and some of them have parents working and living abroad. After repeated campains for rising people's awarness regarding the cautious consumption of water, energy, food, etc, these resources are sufficient. However, because of the small number of students, the teachers specialise to teach all Science subjects (Chemistry, Physics, Biology). Since the number of students in schools is very small, the finances received by schools from the Ministry of Education are less than usual. Consequently, all schools perceive taxes from students and elite schools receive additional financing from other financing sources (*e.g.* companies, NGOs, national and international grants), through partnerships.

Teacher training:

Teachers specialise to teach Chemistry, Physics, Biology, as well as Integrated Study of Science. Since a good collaboration with business medium and a good management of school finances are necessary, top professors and school directors most often have MBA (Master of Buisness Administration) studies.

Scenario B: *No resources, no students*

Teachers' practice in schools:

Many Romanians have migrated abroad and the number of students in a class is very small. Teachers specialise to teach all Science subjects, not only Chemistry, Physics or Biology. The resources are limited and no practical activities are undertaken in secondary schools and high schools. These are substituted with simulations and the utilisation of videos during class. It becomes teachers' responsibility to educate students, parents and the entire population to use the resources in a sustainable way. Curriculum includes a course in which are tackled topics reffering to the social dimensions of science and technology, as well as environmental issues (STSE Education; STSE: Science Technology Society Environment). Blood diamonds, climate change, genetically modified foods, drugs which produce tragic side effects, biodegradable plastics, nanotechnology and society (risks and opportunities) are a few examples of topics covered at this course. Activities at class include debates, simulations, and role-play. A student-centered teaching strategy is used. The focus is not to transmit information, but to form and transform students' thinking and attitude as well as their ethic and moral principles. During such course students' decision making skills and action competence could be fostered. The teacher has also the role of an activist. On request, teachers may have on-line classess with Romanian students who live abroad. Teachers keep workshops on STSE Education for students' parents and any other member of pupulation. Teachers give lectures during workshops for reduction of migration from Romania and for bringing back the Romanian labor force from abroad.

Teacher training:

Teacher training include training for teaching in Science field (Chemistry, Biology, Physics), ESD and STSE Education, as well as courses in sociology, politics, ethics, economy, which are relevant for the STSE Eucation module. Because teachers become change agents as well, their formation imply soft skills courses (negociation, public speaking, communication, etc). Hence, the traditional identity of Chemistry teacher is challenged, because is studying not only other science subjects, but social sciences subjects and soft skills as well.

Scenario C: *Prosperity*

Teachers' practice in schools:

The consumerism level decreased, there is no crisis and hence, people can use resources from local providers. The rate of migration was reduced drastically. There are 20-30 students in a class in state schools. Students are educated taking in consideration developments in technology and the requests of the job market. During every single chemsitry class practical activities are included. Students visit frequently Chemistry companies, universities and research institutes, museums. Through the Einstein exchange programs they visit for 1 month schools from Europe or US.

Teacher training:

Chemistry teachers teach only Chemsitry classes. At university the traditional courses do not take place anymore, but only blocks with practical activities, tutorials and on-line courses. The teaching activities are student-centered, not professor-centered. Student assessments include only evaluation of practical activities (laboratory work, projects, problem solving, etc). Some university modules are interdisciplinary are include also interdisciplinary laboratory work (e.g. biophysic laboratry, chemical biophysics laboratory, etc). The materials necessary for those modules are sent to the students before the module, to be read by students beforehand, in order to avoid cognitive overload during the modules. Even more, the focus is on real work. Hence, students must have:

-placements at Chemistry companies for 6 months, where they can experience different type of work at different departments within the companies;

-studentships for study and research at universities abroad, for a period of 6 months;

-teaching activities in Chemistry, from secondary school level till high school level;

-placements at other types of institutes: museums, town halls, editing houses, etc, for a period of 6 months;

Students must attend courses to form their transferable competenes (people skills, presentation skills, etc).

Scenario D: *Sustainability is a must*

Teachers' practice in schools:

The effects of consumerism were felt in all countries across the globe and there is a great lack of resourses (water, energy, food, etc). The number of jobs were reduced in all countries across the globe. Hence, migration from Romania has reduced drastically. The number of students is at least 30. The society must be trained to use the resources in a sustainable way. Chemistry teachers teach Chemistry classes, as well as courses of ESD. It is also the duty of teachers to train and inform the students' parents with regard to ESD.

Teacher training:

The training of Chemistry teachers include training to teach Chemistry and ESD. Because the resources are reduced, practical activities are replaced with simulations. If any practical activities occur, then the chemicals are recycled.

Annex 2

The Mann–Whitney *U* test regarding the options for Scenarios:

1) A and C

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of AC is the same across categories of GrAC.	Independent-Samples Mann-Whitney U Test	.002	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

2) B and C

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of BC is the same across categories of GrBC.	Independent-Samples Mann-Whitney U Test	.002	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

3) C and D

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of CD is the same across categories of GrCD.	Independent-Samples Mann-Whitney U Test	.008	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

4) A and B

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of AB is the same across categories of GrAB.	Independent-Samples Mann-Whitney U Test	.853	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

5) A and D

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of AD is the same across categories of GrAD.	Independent-Samples Mann-Whitney U Test	.534	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

6) B and D

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of BD is the same across categories of GrBD.	Independent-Samples Mann-Whitney U Test	.382	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

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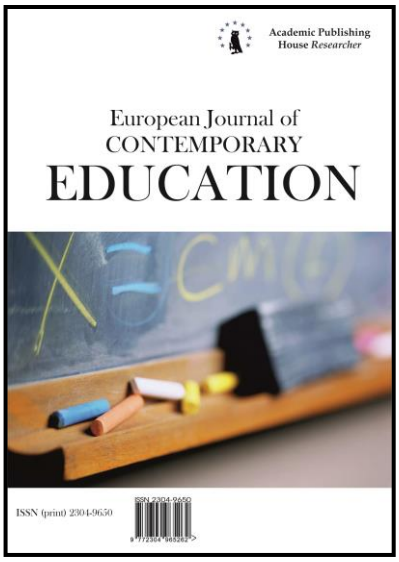

Research into the Play Competences of Children of Senior Pre-School Age

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Abstract

Relevance of the research: This is determined by an obligation to search for opportunities that can potentially make use of play activities observed during the development of play competencies in pre-school children. The purpose of the study: Its purpose is to identify the features of game playing competencies at pre-school age, to determine the dynamics of development of their abilities at senior pre-school age, and to explore variations in the gaming abilities of the children. Methods of research: The principal method in the study of this problem is the included observation. This approach has enabled a comprehensive analysis of the play competences of children of senior pre-school age. Results of the research: The authors present the specifics of the development of play skills in senior pre-school children. They also verify the features of play competencies in groups of girls and boys, as well as identify the structural organization of the play abilities in the senior pre-school age. Practical significance: The materials of the article can be of practical use for pre-school organizations and establishments, as an aid for training and improving the professional qualifications of teachers of pre-school organizations, plus in the practice of family education.

Keywords: play, play competencies, observation of play activities, urge to play, role-playing.

1. Introduction

The playing of games is a vital, innate process that enables a child to thrive in the modern world. Game playing is a joyful state for the child, an important and fundamental element in life development, an activity based upon pleasure, involving uncertainty, challenge, flexibility and productivity. (Declaration, 2015).

The idea of games and play being the most important part of children's life formed the basis for the development of the Federal State Educational Standard for Pre-School Education (FSES-

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PSE), and also the Professional Standard for Teachers.

According to the requirements of FSES-PSE, the implementation of the pre-school education program should be carried out "in methods specific to children of this age group, primarily in the form of a game..." (FSES-PSE, 2014). It is during game play that "a full-fledged residence", by a child of the pre-school childhood period, is possible. Conditions are created that enhance and expand the opportunities for child development. Professional Standards enable the teacher to identify and focus upon such tasks as providing nondirective help to children, supporting their spontaneous play, enriching it, plus ensuring that game time and space is made available (Teacher's Professional Standard, 2017).

The game, play activity, relationships in the game and features of play activities have often been the subjects of foreign and domestic research, both in psychology and in education:

- an 'activity' approach to the development of the game (Dyachenko, 2007; Panko, 2009; Polivanova, 2016; Smirnova, 2010; Trifonova, 2014; Elkoninova, 2007);
- the relationship of children in the game (Abramenkova, 2000; Litvinova, 2003; Samsonova, 1995);
- game as a condition for the socialization of the child (Anikeeva, 1987; Gazman, 1991; Reprintseva, 2008; Chernaya, 2010; Landreth GL, 2012; Schaefer, 2001);
- self-regulation in the game (Sharov, 1997; Chernobrovkina, 2004);
- a socio-evolutionary approach (Rakoczy, 2010);
- a cognitive approach (Leslie, 2000).

An important component of game activities can be found in the development of play abilities that allow children of pre-school age to successfully socialize and therefore more easily build relationships with peers and adults. It is the development of play abilities that helps pre-school children to further achieve the targets set out in the FSES-PSE (FSES-PSE, 2014).

Based upon the main features of play, relying on the structure of the specific game and its doctrines, demanding, behavioral, communicative and cognitive, we discover the following definition of play competence: play competence is related to acquiring the skills necessary for the implementation of each specific play activity. They include motivational- and emotionally-evaluated components.

2. Materials and methods

We organized this study of play competencies on the basis of observations of role-playing games, utilising the observation table 'Study of the play capabilities of children of senior pre-school age'.

This table is represented by five blocks, namely: motivational-need, cognitive, behavioral, communicative, and emotional-evaluation.

Each block is represented by indicators which characterize the playing abilities of children in the senior pre-school age group, as expressed through role-playing:

1) Motivation and needs component: The childs natural urge to play, their ability to formulate a play goal and to set a play task, freedom to plan the game plot, then using initiative and independence to choose a role and also the play actions;

2) Cognitive component: Modeling of the plot, incorporating ideas about the surrounding world into the game, demonstrating rational thought processes within the play, exhibiting imagination and creativity, plus identifying the timescale over which the story will unfold;

3) Behavioral component: Role conduct (the ability to choose a character and the show of a degree of awareness about it, the stability of the role, the expressiveness of the character, plus making a preference about which role to take). The play actions (matching the play actions of the chosen role, the content and variety of play actions, the nature and the degree of generalized play actions). Play subjects (the characteristics of the play objects used, the degree of independence shown in the choice of substitute items and attributes for games). Game relations (the nature of play associations, the nature of play relationships, plus the ability to negotiate with peers during play);

4) Communicative component: Accompanying independent play with speech, speech activity during the play, and the featuring of role-playing speech in the game;

5) Emotionally-appraising component: Demonstration of passion, attitude, and the expression of emotions during play.

Evaluation of the play competences is measured on a five-point scale. Each indicator is estimated, ranging from 1 (minimum), through to 3 (enough), and up to 5 points (excellent).

When calculating this observation data the main (1, 3, 5) and intermediate (2, 4) scores are used.

Based upon the evaluation of the blocks and indicators a conclusion is made about the development of competencies in the role-playing game amongst children of senior pre-school age:

From 1 to 2.5 points – the minimum level.

From 2.6 to 4 points – a sufficient level.

From 4.1 to 5 points – an excellent level.

Filling the observation card requires the maintenance of a surveillance protocol.

Qualitative and quantitative methods were used in order to process the data obtained. The results are presented as indicators of the mean of the parameter. When making comparison of independent groups, the Student's T-criterion for independent samples was used. Cluster analysis of observations and hierarchical clustering, by the method of intergroup relations, were also used for data processing.

The study involved pupils from the 5-7 year old group, all enrolled at pre-school educational organizations in Moscow. The total number of subjects studied was 179.

3. Results

Let us dwell on the results of the study of play competences of children of senior pre-school age, using the Observation Card 'Study of the play competences of children of senior pre-school age'.

The average value of play competency development in children of senior pre-school age is 3.78 points, which relates to the 'sufficient' level.

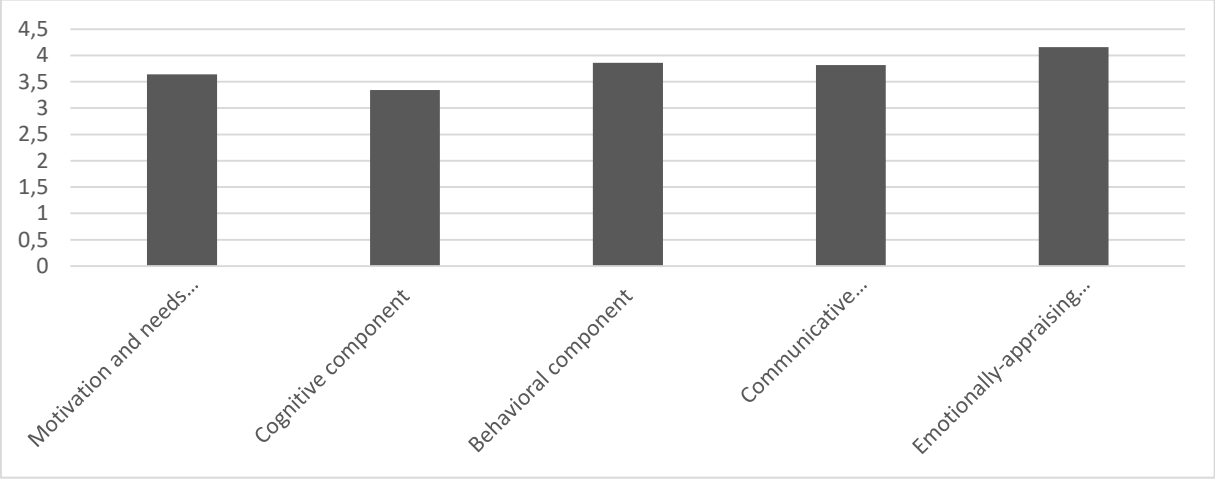

Fig. 1. Average values of the main components of play competencies for children of senior pre-school age

The smallest values for the development of play competencies are revealed in the cognitive component. The obtained data is confirmed by results of the observations of the children's play activity, which show that children do not sufficiently use the ideas about the surrounding world (physical properties of objects, geographical representations) in their play, only occasionally supplementing traditional games with their own ideas about reality, the monotony of plots and play actions.

A more detailed analysis of the play competence indicators - characterizing the 'motivational and need' component - shows that the 'urge to play' indicator (4.27 points) is the most pronounced (Figure 2). The lowest indicators are found in the areas of 'self-reliance in plot planning' (3.42 points) and 'independence and initiative in choosing a role' (3.40 points).

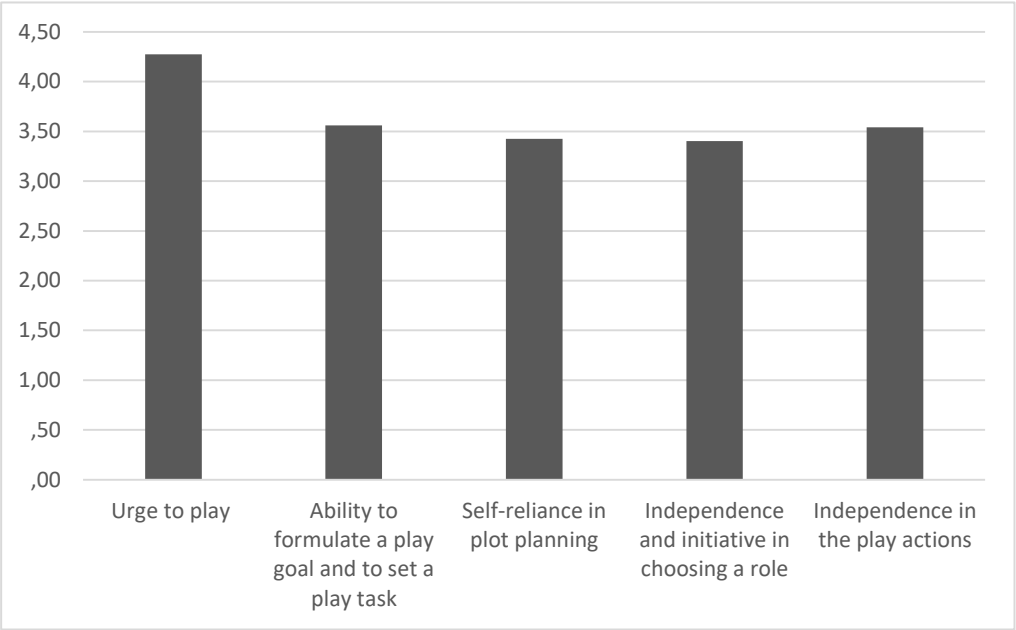

Fig. 2. Average values of the 'of the motivational and need component' of play competences

Next we turn attention to the analysis of the behavioral component of the play competencies (Figure 3).

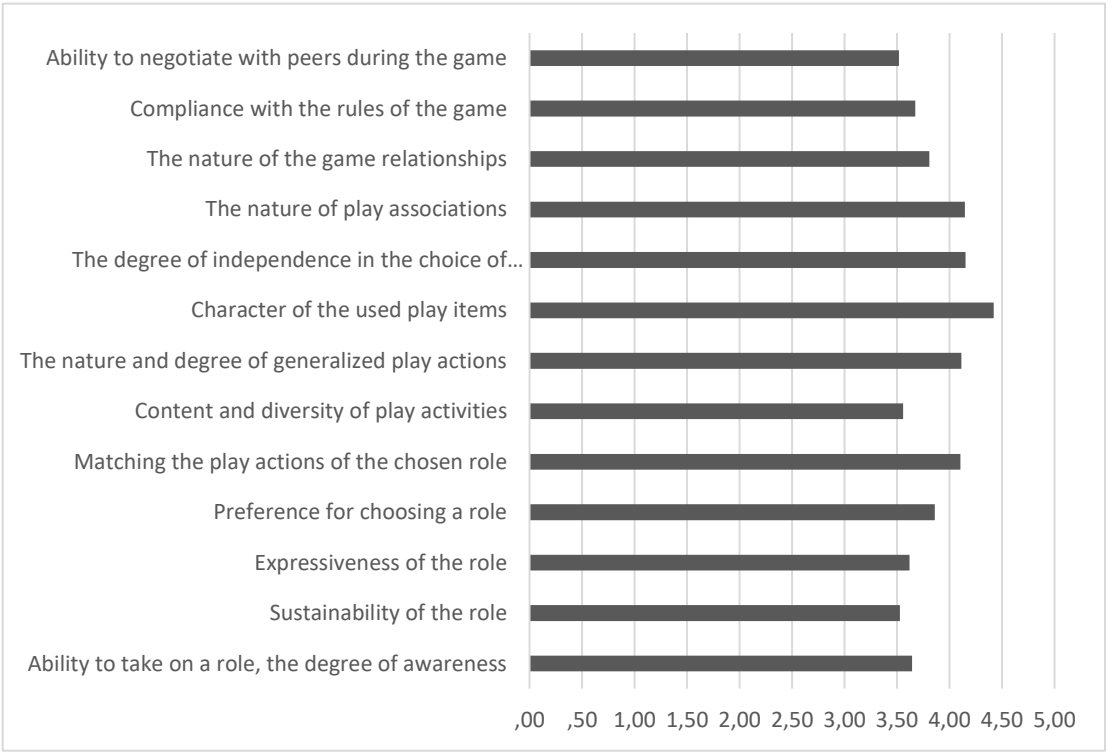

Fig. 3. Average values of indicators of the behavioural component of playing competencies

The overall average value for the 'behavioural component' is 3.86 points, with deeper analysis showing that the most significant indicator within this block is 'Character of the used play items' (4.42 points). This indicator is the closest to the values of the 'excellent' level of development of playing competencies. It reflects well on the ability of children to select game items in accordance with the role. Other aspects which are indicated to top the 4-point threshold are 'The degree of

independence in the choice of substitute items and attributes for games' (4.15 points), 'The nature of game associations' (4.15 points), 'The nature and degree of generalized game actions' (4.11 points) and finally 'Matching the game actions of the chosen role' (4.10 points). These indicators suggest a fairly high level of development of play competencies, in terms of the formation of game actions, the use of play items and the development of game relationships.

Next, we attempted to identify the specific details of play competencies in groups of boys and girls. The data obtained from both groups, characterizing the playing abilities of the children of the study group, are reflected in Table 1. The level of development of play competencies in groups of boys and girls achieves 'sufficient' level (3.67 and 3.91 points, respectively). It should be noted that, in the case of the girls' group, higher values for all indicators of play competencies are revealed (Table 1). The one exception was the indicator for 'The degree of independence in the choice of substitute items and attributes for games.'

In terms of reliability in the average points differences between the boy and girl groups, we settled upon the 'Student's T-criterion'. As can be seen from Table 1, significant differences are revealed in the averages for 'The duration of unfolding game scenes' ($t = 2.437$ for $p < 0.016$), which indicates that girls are characterized by a preference for playing longer games. They have the ability and desire to play a game for several days and, as a rule, are able to resume the interrupted storyline each day. The trend is established that the results of girls are higher for the parameter 'Stability of the role' differ ($t = 1.965$ for $p < 0.051$). This demonstrates that a group of girls will tend to project more stable role behaviour throughout a game, than an equivalent group of boys.

Table 1. The average values of the playing competencies in the separate girl and boy groups, showing the variances in their differences, according to the Student's T-criterion.

Indicators of play competence	Group		Student's T-criterion	The Importance of Diversity
	of girls	of boys		
Urge to play	4,32	4,24	-,425	,672
Ability to formulate a play goal and to set a play task	3,61	3,52	-,367	,714
Self-reliance in plot planning	3,63	3,26	-1,515	,132
Independence and initiative in choosing a role	3,54	3,30	-,956	,340
Independence in the play actions	3,70	3,42	-1,193	,235
Simulation of the plot	3,30	3,07	-1,023	,308
Duration of unfolding game scenes	3,81	3,27	-2,437*	,016
Ability to take on a role, the degree of awareness	3,72	3,58	-,708	,480
Sustainability of the role	3,76	3,34	-1,965*	,051
Expressiveness of the role	3,81	3,46	-1,627	,106
Preference for choosing a role	3,94	3,80	-,643	,521
Matching the play actions of the chosen role	4,32	3,93	-1,914	,057
Content and diversity of play activities	3,77	3,40	-1,734	,085
The nature and degree of generalized play actions	4,27	3,99	-1,543	,125
Character of the used play items	4,57	4,30	-1,572	,118
The degree of independence in the choice of substitute items and attributes for games	4,12	4,18	,371	,711
The nature of play associations	4,21	4,10	-,526	,600
The nature of the game relationships	4,00	3,65	-1,742	,083

Compliance with the rules of the game	3,73	3,63	-,488	,626
Ability to negotiate with peers during the game	3,58	3,47	-,472	,637
Accompaniment of independent game speech	3,89	3,87	-,085	,933
Speech activity during the game	4,00	3,73	-1,339	,182
Features of role-based speech	3,91	3,62	-1,424	,156
Emotional attitude to the game	4,30	4,04	-1,200	,232

*Here: * – p<0,05*

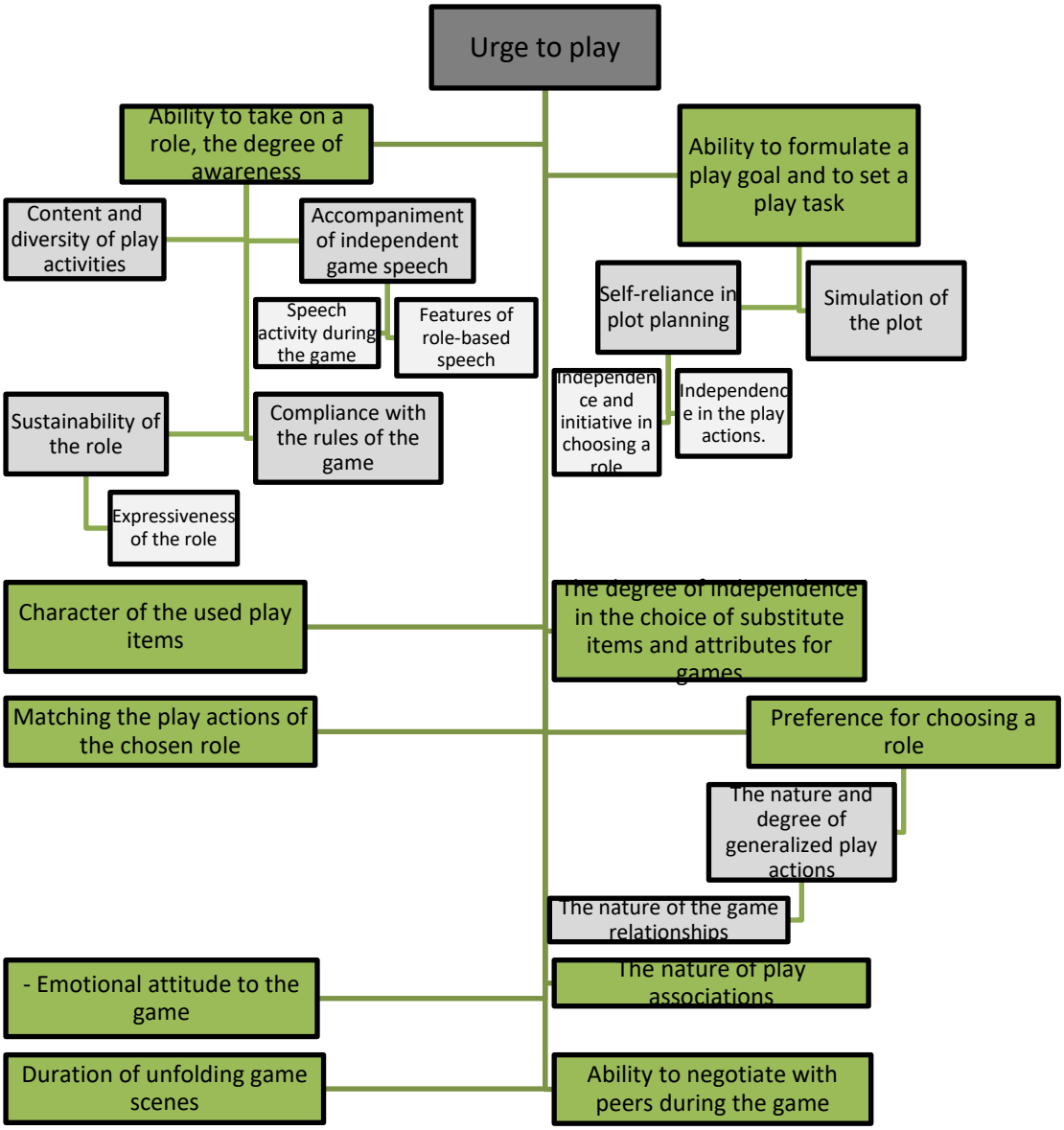

Fig. 4. Hierarchical structure of play competences of children of senior pre-school age

When considering the specifics of the development of play abilities at senior pre-school age it is important to identify the algorithm that drives their manifestation and development. To this end we carried out a hierarchical cluster analysis. On the basis of hierarchical clustering, we created a structural diagram of the play competences of children of senior pre-school age (Figure 4).

Figure 4 shows that, in the hierarchical structure of play competencies, in children of senior pre-school age, the indicator for 'Urge to play' occupies the lead position. It therefore follows that, in the development of play competencies, it is necessary to accept and support that there is a natural need in children to play.

4. Discussions

Analysis of the practices of pre-school educational organizations and establishments indicate that there is a contradiction, with, on the one hand, recognition of the role of 'the game' in the development of a child of pre-school age, yet, on the other, an insufficient utilization of its potential to enhance the lives and activities of children of this age. In this case, the pre-schooler's play patterns determine the formation of the main foundation of their age and establishes the personal meanings that motivate the activity. An important component in play involves the formation of play competencies that allow children of pre-school age to socialise successfully and build relationships with peers and adults. This situation creates a need to consider the features of the play activities of modern pre-school children and to search for opportunities to use the potential of these activities in the formation of play competencies for pre-school children.

As the results of our study show, the 'emotionally-evaluative' component is the one which displays the highest average value from play competence indicators. This is characterised in the manner by which children demonstrate a positive and stable attitude to the game, are generally able to control their emotions during the game, plus can sympathise and empathise with the characters and other participants of the game. The lowest rating values for the development of play competencies are revealed in the cognitive component area. According to the studies of E. Lasley, L. Haas and D. Nabors, when playing, children ask more analytical questions, weigh up their choices, build new schemes, structure, and restructure, cause-effect relationships (Lasley et al., 2016). In this case, we consider it necessary to use the potential of children's play in the cognitive development of children of senior pre-school age.

Analysis of the indicators of play competencies show that it is the 'Urge to play' that proves to be the most significant indicator. As B. K. Olofsson suggests, the children "can, for a long time, keep playing an activity if others do not interrupt them and do not force the child to grow prematurely" (Olofsson, 2015).

In this case, the 'need' for the game play is what determines the development of the capabilities of the lower level. Namely, this involves the ability to take on a role, to develop an ability to formulate a game goal, to set a game task, as well as a number of other indicators that involve behavioural, cognitive and emotional-valuation components. We can assume that the urge to play, stipulating the development of the underlying play competencies, develops to a higher level, which in turn ensures an even higher level of progress in play abilities with children of senior pre-school age. Thus, some kind of inter-dependent system for the development of play competencies of children of senior pre-school age is determined by the urge to play.

The least sign of improvement tend to be found in the areas of 'Self-reliance in plot planning' and 'Independence and initiative in choosing a role'. This may be due to the fact that, quite often, playing activity in an educational organization is a purposeful process, organized by an adult. "In their desire to provide for all the potential threads for child development, adults leave little time for play activities... "Children do not enter into the life of adults, they create their own worlds, ones that, whilst extremely saturated, are nevertheless isolated, within which children exist" (Avdulova, 2009). In this regard, in the early pre-school period, children from an under-developed form are presented with an opportunity to independently plan the plots of games, and use their initiative, when choosing a role. Children of older pre-school age often develop and expand upon the stories that were initiated by adults. They are, however, not always able to choose the role themselves due to the process of role allocation generally being controlled by an adult.

5. Conclusion

The conducted research allowed us to conclude that the following features of play competences of children of the senior pre-school age are fact:

1. The development of play competencies in children of senior pre-school age is at a 'sufficient' level.

2. The most significant element in the average values of the play competence indicators is the 'emotionally-evaluated' component, as characterised by the fact that children who demonstrate a positive and stable attitude to game play, are, in most cases, able to control their emotions during such games, and also can sympathise and empathise with the characters and participants that they engage with, within the game.

3. Analysis of the average values of the various indicators of play competencies have revealed that the most pronounced indicator of all is that of the 'Urge to play'. The importance of this pointer in the structure of play competencies is confirmed by the results for 'Cluster analysis' and offers grounds to argue that the development of the system of play competences for children of senior pre-school age is determined by the 'Urge to play'. This urge influences and determines the ability to take on a role, affects the degree of awareness and the ability to formulate a game goal, enables the setting of game tasks, as well as a number of other indicators of behavioural, cognitive and emotional-valuation components.

6. Recommendations

The materials and conclusions of this article can be useful in the decision as to which practices might be employed by pre-school organizations and establishments, and also for the training and development in professional qualifications for teachers of pre-school organizations who are engaged in the practice of family education.

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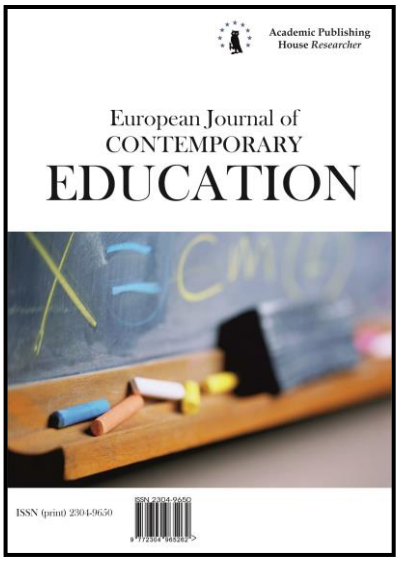

The History of Education

Project of Reforms Proposed for the Don Public Education IN THE first half of 1860: A.M. Dondukov-Korsakov, Kh.I. Popov, N.I. Krasnov

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Abstract

The paper reviews the project of reforms in the Don education, which were proposed by prominent public figures in the early 1860s., namely by A.M. Dondukov-Korsakov, Kh.I. Popov and N.I. Krasnov. Based on archival materials and publications by these authors, which in some cases have not been previously used in scientific studies, the paper shows that it was the different visions of the future Don education, which revealed a very clear and representative distinction between Don conservative "Kazakomans," (from Kazakomanstvo – Cossack-mania) and liberal "Progressists". Kazakomans counted on consistent reforms addressing the most pressing and obvious issues of the Don education. Contrary to them, Progressists believed that these issues would sort themselves out following the system reforms of the Cossack society, which would eliminate it as a purely military estate. Unfortunately, due to the political struggle, neither Progressist nor Kazakoman version of the reforms saw the light of the day, which had a negative impact on further development of the Don education.

Keywords: Land of the Don Host, Don Cossackdom, Don education, A.M. Dondukov-Korsakov, Kh.I. Popov, N.I. Krasnov.

1. Introduction

The 1860s were a time of hopes and fears for Russian Cossacks, a time when the authorities and local public figures proposed blueprints for radical reforms and at the same time were concerned that the poorly-conceived transformations could ruin the Cossack estate itself. Even

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conservatives saw the need for some changes, but they urged to take a path of evolution, rather than a revolution from above. In 1862, an anonymous conservative author, who hid himself behind the pseudonym "The Orenburg Cossack," reminded in the official "Voenny Sbornik" (Military Collection of Articles) that "no matter how commendable is the aspiration to improvements in general, but achieving right and favorable results in the improvement process <…> requires implementing the law of succession" (Orenburg Cossack, 1862: 103).

And in the Don Host, both conservative "Kazakomans" and liberal "Progressists" attached great expectations to the sphere of education. Although Don Cossacks were traditionally literate and intellectually developed, they themselves expressed the training initiative, rather than local authorities. V.D. Novitsky, an official from another town, who served in the Don region in the 1860-70s and was far from not at all sympathetic to Cossacks, wrote that "literacy in the Don Host formed itself and followed a consciously path even when the Ministry of Education was in the cradle to address literacy among the people" (Novitsky, 1991: 58-59). However, the Don Cossacks' craving for literacy found very limited support in the government: in the early 1860s, in the Land of the Don Host, one student was accounted for by 321 people, and this proportion was one of the worst in entire European Russia (Krasnov, 1863: 402). Nevertheless, the educational system that evolved in the Don Oblast by this time also had advantages. For example, talented Cossacks, even from common and poor families, had a chance to study at a high school or a university at public expense (Peretyatko, Zulfugarzade, 2017: 376). However, it was the opinion of local public figures that the time had come to initiate major reforms to propel the Don national education to the next level.

In our paper, we aim to analyze the views of three authors who regarded the future evolution of the Don Cossacks as inextricably linked with the progress of the public education system on the Don. They belonged to completely different social groups, and in the discussion on the future of the Don, which took place in the early 1860s, they joined the opposing camps – A Russian aristocrat, prince A.M. Dondukov-Korsakov, and a common Cossack, Kh.I. Popov, supported Kazakomans at this time, while N.I. Krasnov, a representative of a noble Don family, was a convinced Progressist. Based on their texts, we will endeavor to understand what changes liberals and conservatives wanted to see at Don schools, what barriers hindered the development of education on the Don, and whether government regulations of the early 1860s were effective in addressing them.

2. Materials and methods

The foundation for our study will created by the following primary sources: works by A.M. Dondukov-Korsakov, Kh.I. Popov and N.I. Krasnov, written in the early 1860s. Some of these texts have long been familiar to scholars and are used in scientific studies. "The Note on the Don Host" (Zapiska o Voiske Donskom) by A.M. Dondukov-Korsakov was analyzed and published in full by a local Don historian, A.A. Karasev already in 1896 (Karasev, 1896: 569-591), "Materials for geography and statistics of Russia, collected by officers of the General Staff. The Don Host Oblast" (Materialy dlya geografii i statistiki Rossii, sobrannye ofitserami Generalnogo Shtaba. Zemlya voiska Donskogo) by N.I. Krasnov are the most complete historical and statistical description of the Don in the middle of the 19th century. "A Cossack's thoughts on the Cossackdom concerning the current rumors" by Kh.I. Popov is less known, but it was mentioned in the latest historical literature (Volvenko, 2015: 199). Despite the above references, both Kh.I. Popov and N.I. Krasnov remain be half-forgotten authors of a kind. Their names are familiar to any serious student of the Don region history, but many of their works, including those which particularly focus on the educational issues, have attracted only cursory attention of historians so far.

This specifically refers to "The remarks of the deputies, appointed by stanitsas of the Khopersky district, on the proposed main provisions of the Regulations on the Don Host" (Zamechaniya deputatov, naznachennykh ot stanits Khoperskogo okruga, na proyekt osnovnykh nachal Polozheniya o Voyske Donskom). This work is not written exclusively by Kh.I. Popov, but the Don local historian played an active role in its creation and edited the final version of the document (Dontsy, 2003: 409). Moreover, while working on the manuscript of "Comments…," which is, by the way, stored in the Kh. I. Popov fund in the State Archive of the Rostov Region, we found out that part of the text was written personally by him (the handwriting is identical to a signed note on the margins (GARO. F. 55. Op. 1. D. 240. L. 66). A comprehensive and detailed text of the manuscript contains the opinions of simple Cossacks of the Khopersky district regarding the

vital needs of Cossacks, but, unfortunately, even R.G. Tikidzhyan does not mention it in the paper specifically devoted to the preparation of the new "Regulations on the Don Host" (Tikidzhyan, 2014: 95-98).

An even more interesting situation developed around "Military Review of the Land of the Don Host" (Voyennoye obozreniye Zemli Voyska Donskogo) by N.I. Krasnov. Contemporary historiography positions the Don statistician as the author of two major books, "Materials for geography and statistics of Russia, collected by officers of the General Staff. The Don Host Oblast" and "Military Review of the Don Host Oblast" (Korolev, 1991: 237). The year of publication of the second work raises certain doubts, and we expressed our disagreement with V.N. Korolev who dated it 1864 (Peretyatko, 2017: 6). However, our work at the Russian National Library allowed us to come to an unexpected conclusion: it turned out that N.I. Krasnov wrote two books with the same title "Military Review of the Don Host Oblast," in which only a part of the text coincides. While the 1870 edition is used by modern authors, the book of 1864, which criticises the proposed governmental reforms in the Cossack host, is just unknown to historians who chose the second half of the 19th century as the area of their expertise.

Since our research employs the texts, which so far have not been spotlighted by historians, we will apply the descriptive method to retell and quote key points in them. The comparative method will be instrumental to us both to compare the proposals on the coming reforms in the Don education, put forward by different authors of the early 1860s, and to identify their connection with governmental reforms and the Don day-to-day realities.

3. Discussion and results

The thought leader of the Don Kazakomans and even a "martyr" for their cause was the Chief of Staff of the Don Host, Prince A.M. Dondukov-Korsakov. In 1862, when the government's projects of proposed radical reforms reached Novocherkassk, the young general, who was expected to become an ataman in the future, expressed complete disagreement with them, voicing his criticism not only unofficially, but also in "The Note on the Don Host," sent to the Ministry of War of the Russian Empire. The official's demarche did not go unnoticed and almost cost him his career: A.M. Dondukov-Korsakov was removed from office and was in disgrace until 1869 (Karasev, 1896: 570-571). But within the framework of our research, it is more important that "The Note on the Don Host," the first policy paper of the Don Kazakomans, gives educational problems a noticeable or even a key role.

It is the item on "the distribution of funds for the education of the young Cossack generation" which opens its section "Current needs of the Don Host" and is an alternative scenario of future reforms. A.M. Dondukov-Korsakov drew the attention of the imperial authorities to three issues that required immediate solutions. First of all, in the early 1860s, the only high school in the Don Host Oblast, located in Novocherkassk, did not even have its own building, and had to operate in a small private home. As a result, the high school management could not accept all those who wished to study, and had to refuse potential students simply because of the lack of space in the classes (Karasev, 1896: 580). Another problem was that one high school was evidently not enough for 14,000,000 dessiatines of land, and there was an urgent need for a new secondary school in the up-river areas (Karasev, 1896: 580). Finally, many villages realized the need to arrange their own secondary schools, and applied to local administrations to open the institutions (Karasev, 1896: 580). According to A.M. Dondukov-Korsakov, Cossacks themselves, from noblemen to ordinary Cossacks living in stanitsas, were well aware of these three issues and "constantly expressed their aspirations" to address them and "eagerly awaited for their fair hopes to come true" (Karasev, 1896: 580).

But the military authorities could not meet the expectations. The reason for the barrier was an ill-conceived policy of rigid centralization, which prevented the opening of new educational institutions, even when local and imperial authorities had the required funds and were willing to do so. For example, in 1861, the Ministry of War gave an order to construct two buildings for high schools in Novocherkassk and even allocated appropriate funds for the purpose. However, the construction was not started in 1862, and, based on his past experience, the Chief of Staff of the Don Host supposed that the proper order of the government would be drown in the sea of recommendations and approvals, and would not be executed because of bureaucratic paperwork (Karasev, 1896: 580-581). "Most of such projects drag on for several years, are returned to make

changes to the designs of some column cap, a pediment or an internal arrangement of rooms, which is most easily evaluated on site and by the direct authorities, and are approved when the quoted prices in initial estimates do not correspond to the existing ones" (Karasev, 1896: 581). A.M. Dondukov-Korsakov warned that rumors already circulated in the Cossack community that "the government is aimed to suspend education of Cossacks," because even the Don region most pressing need for primary and secondary schools were not satisfied (Karasev, 1896: 581).

Thus, the ideologist of Don conservatives, a man who earned great respect in the Cossack community (Karasev, 1900: 167-174), believed that the coming reforms of the Don Cossackdom should be started with expanding the network of primary and secondary schools in the Don region. And, paradoxically, this part of the "The note on the Don Host" was implemented almost in full, despite the author being in disgrace. The 1860s became a time when the number of schools grew exponentially on the Don. While there were 28 parish secondary schools in Cossack stanitsas and farms in 1859 (Krasnov, 1863: 398), their number had reached 110 by 1868 (Krasnov, 1870: 227). Particular improvements could be seen in the situation with the peasant education, which was, without exaggeration, disastrous: in the late 1850s, peasant settlements in the Don Host Oblast had not a single school, and only 52 peasant children studied at parish schools in Cossack stanitsas (Krasnov, 1863: 401-403). And within one decade peasant settlements already outstripped them in the number of schools: there had been117 schools functioning there by 1868 (Krasnov, 1870: 228). A Don statistician of the late 19th century, S.F. Nomikosov, already noted that there was an unprecedented quantitative leap in the Don education in the 1860s. Although he highlighted another point: while in Nicholas' epoch enrollments at Don schools grew quite slowly, and it only doubled over 30 years from 1830 to 1860, over the next decade the number of schoolchildren increased sixfold! It is significant that the growth rate of school enrollments again slowed after 1870, although it was much higher than performance in Nicholas' period (Nomikosov, 1884: 575). The growing number of schools and pupils at them was mainly contributed by parish secondary schools, but the 1860s also marked the opening of the second high school on the Don. As A.M. Dondukov-Korsakov proposed, it was established in the up-river districts of the Don Host Oblast, in the Ust-Medveditskaya stanitsa (Donskova, 2011). Nevertheless, the number of people, who received a robust secondary education, demonstrated an insignificant growth. If the late 1850s registered 532 people who studied at the Novocherkassk high school, the number of students in both high schools – in Novocherkassk and Ust-Medveditskaya – did not exceed 785 people in the late 1860s (Krasnov, 1870: 227).

It remains to acknowledge that the reform of local education, proposed by A.M. Dondukov-Korsakov, really reflected "the actual need of the Don Host," and neither party struggle between Don liberals and conservatives, nor limited resources of the Ministry of War hampered the implementation of the reform. In fact, A.M. Dondukov-Korsakov offered to bring the system of the Don educational institutions to a state that would at least help to satisfy minimum needs felt by Cossacks and at least address its most evident and conspicuous issues.

Other Kazakomans went much further in their hopes and proposals. In 1863, in the environment of open discontent with governmental projects of the coming transformations, the Ministry of War gave the green light to rather a bold initiative of Army Ataman P.Kh. Grabbe. As a result, stanitsa deputies were allowed to have a hand in the formulation of the new "Regulations on the Don Host," an underlying document that defines the rights and duties of the Don Cossacks (Volvenko, 2014: 16). On November 8 of the same year, representatives of the up-river Khopersky and Ust-Medveditsky districts began their joint meetings (GARO. F. 55. Op. 1. D. 240. L. 1-10b). The Preobrazhenskaya stanitsa elected Kh.I. Popov, later a famous Don local historian and founder of the Don Museum, to represent the settlement at this meeting (Dontsy, 2003: 409). The document "The remarks of the deputies, appointed by stanitsas of the Khopersky district, on the proposed main provisions of the Regulations on the Don Host" (Zamechaniya deputatov, naznachennykh ot stanits Khoperskogo okruga, na proyekt osnovnykh nachal Polozheniya o Voyske Donskom), created by the deputies of the up-river stanitsas, appeared to crystallize not only the position of the people living in the Khopersky district, but also the opinion of the entire Kazakoman majority among the Don Cossacks. The deputies, appointed by the Ust-Medveditsky district, as we have already mentioned, initially gathered at joint meetings with the Khopersky district representatives, and apparently intended to jointly draw up a text that would oppose the government's project. This is already evidenced by the fact that the draft handwritten text of

"The remarks..." started with the preamble which positions it as the result of collaborative efforts by the representatives of the Khopersky and Ust-Medveditsky districts. And it was not until afterwards that the reference to Ust-Medveditsky district deputies was deleted (GARO. F. 55. Op. 1. D. 240. L. 1). In our view, the act can be explained not through some controversy but this can be done for the sake of apparat struggle. Starting from the middle of the text, references to the representatives of the Ust-Medveditsky district change their character, and they speak not of their consolidated position with the Khopersky district deputies but that the Ust-Medveditsky deputies independently drew similar conclusions (GARO. F. 55. Op. 1. D. 240. L. 310b-32). Probably, it was supposed that two documents from different districts would make a greater impression on the government than a single jointly prepared paper. The attitude to the text of "The remarks...," which existed among Cossacks of other Don districts, can be seen in the following fact. Shortly after they were completed, Kh.I. Popov was appointed representative of the entire Don Cossackdom to the main committee that was engaged in devising new "Regulations on the Don Host" (Dontsy, 2003: 409).

"The remarks of the deputies, appointed by stanitsas of the Khopersky district, on the proposed main provisions of the Regulations on the Don Host" contain a broad range of points on the Don education. This seems logical to us, since Kh.I. Popov, who had an active role in formulating this document, as did A.M. Dondukov-Korsakov, believed that the Don's successful future could be driven precisely by enhancing education in the Cossack community. A few months before the representatives of the up-river districts opened their meetings, the future Don local historian published an article in the military edition "Donskiye voiskovye vedomosty," where he came up with his own program for the reforms of the Cossack community. Of the eight points in this program, two dealt with education. Almost literally quoting the words of A.M. Dondukov-Korsakov, Kh.I. Popov called on the government to "increase funding for education" in the territory of the Don Host Oblast. However, unlike his ideological predecessor, the deputy from the Preobrazhenskaya stanitsa urged that not only new secondary and high schools should be to created on the Don, but a full-fledged university should be set up in the region (Kh.P. 1863: 2-3). This proposal seems to be as audacious as it was unrealistic: in the context of the poorly developed network of Russian universities in the 1860s, the Don Host Oblast, which had no large cities, was territorially located near the Kharkov University and operated only two high schools on its entire area, was by no means suitable for the role of a new university center. However, the second proposal by Kh.I. Popov looks far more attractive. The Don social activist considered it necessary to exempt Cossacks "who received vocational knowledge, and scientists and artists who received education at their own expense" from the compulsory military service (Kh.P, 1863: 2-3).

It was this idea that "The remarks of the deputies, appointed by stanitsas of the Khopersky district, on the proposed main provisions of the Regulations on the Don Host" put the greatest emphasis on – the idea of conferring on educated Cossacks special rights. In principle, it could not be described as a new concept, because certain steps in this direction were taken by the government even before the 1860s, but they achieved no good results. The Novocherkassk high school, in addition to standard curricula, delivered courses in agriculture, legal and military science. Those who graduated from these courses and who had high average grades (over 4) were granted the right to receive the first commissioned grade immediately after graduation (Krasnov, 1863: 399). Unfortunately, in practice, courses in legal and military science were run instead of Latin lessons, and the number of those who signed up for them was small, and these were mostly weak students. As a result, over 2-3 years only one graduate of a high school could become a candidate for a commissioned grade, and the rest, because they had low average scores or failed to take the course in military science, had serve in the army on a regular basis (Krasnov, 1863: 399). The Ministry of War realized the depravity of this situation and proposed in its draft reform to give special benefits in obtaining commissioned grades to all graduates of the Novocherkassk high school, who completed the military science course. On the other hand, the scope of these benefits was reduced. When enrolled in the service, such graduates could claim only the grade of uryadnik (junior officer), while the first table of ranks grade of khorunzhiy (senior officer) was given only after a year of service (GARO. F. 55. Op. 1. D. 240. L. 41-410b).

The deputies found this proposal too limited. They believed that it would be reasonable to entitle Cossack high school graduates to a simpler promotion to the first table of ranks grade when being enlisted both for the military and civil service. Accordingly, there was no point in tying this

privilege to course in military sciences, but it was necessary to give it to all Cossacks who graduated from high schools (GARO. F. 55. Op. 1. D. 240. L. 41-410b). Unfortunately, the text of "The remarks..." does not provide a more detailed substantiation for this decision, but it seems that representatives of the Khopersky district wanted to stimulate the Cossacks who received the education. There are no detailed motivations in those parts as well, which recommend to facilitate the career progression of graduates of other educational institutions, but the opportunities that the deputies wanted to give them were very rich. In this respect, it was actually recommended to confer graduates of theological seminaries the same status as that of high school graduates (GARO. F. 55. Op. 1. D. 240. L. 41-410b). And it was also advised to give those who successfully completed the academic program at district secondary schools the right to apply for uryadnik grades after the first year of service (GARO. F. 55. Op. 1. D. 240. L. 410b-42).

The text of "The remarks..." also supported the proposal made by Kh.I. Popov to exempt the Cossacks who received a vocational education from the compulsory military service and all related duties without any compensation. It specifically emphasized that all rights due to the Cossack estate, including the right to own land shares, should be preserved by educated Cossacks (GARO. F. 55. Op. 1. D. 240. L. 60b). In their core, the proposals put forward by Khopersky deputies actually implied that in addition to the Cossack nobility and tradesmen, one more sub-class would appear on the Don with its own set of rights and duties, a group of educated Cossacks.

The proposal to exempt educated Cossacks from conscription to some extent resonated with the concept of "Don Host citizens," popular among the Ministry of War officials in the 1860s. According to this concept, which was in place for a short time in most Cossack troops in the next decade, part of Cossacks were completely exempted from military service for additional tax and could channel their skills and energy to the civil development of the region (Volvenko, 2016: 68-71). This organization of the Cossack society did not survive, and contemporaries criticized it, among other things, for the fact that Cossacks most often get into the group of "Don Host citizens" not because they were willing to engage in agriculture, trade, manufacturing or other activities incompatible with the active service, but thanks to a mere game of chance (Khoroshkhin, 1873: 143). The proposal of the stanitsa deputies to exempt from conscription on the basis of the received education looks much more logical and thoroughly considered, and it only remains to regret that it was not put into practice because of the opposition between the imperial authorities and Don conservatives.

"The remarks of the deputies, appointed by stanitsas of the Khopersky district, on the proposed main provisions of the Regulations on the Don Host" also contain other ideas for reforms required for the Don education. The most important of these them offers that all Cossacks should have equal rights to education. The deputies only formulated a general concept of the proposal, demanding to legally formalize the situation of the early 1860s, when children of various descent – from noble Don families to ordinary Cossacks – were admitted to most civilian educational institutions on equal grounds (GARO. F. 55. Op. 1. D. 240. L. 41), and when defining the status of specific educational institutions, both civilian and military ones. For example, the situation regarding the school of Don uryadniks (military officers) was recognized as extremely unfair (it is evidently about the class of Don uryadniks in St. Petersburg, since there was no separate school of Don uryadniks in the early 1860s (Krasnov, 1863: 402). Representatives of the Khopersky district noted that tuitions were paid by the entire host, but only noblemen had the right to study in the institution. According to the authors of "The remarks...," the only way to remedy the situation was the permission to admit all Cossacks to the school of uryadniks, regardless of their origin (GARO. F. 55. Op. 1. D. 240. L. 51). An equally unfair situation existed around the Oriental languages department of the Novocherkassk high school, although the reason for it was different. While all other departments accepted on equal grounds children of all Cossacks, the Oriental languages department was open only to the children of noblemen and officials. The deputies saw no rational explanation for such a distinction and proposed to lift it (GARO. F. 55. Op. 1. D. 240. L. 64). Finally, the deputies did not bolster their idea to restrict women's education on the Don to daughters of noblemen, officials, priests and merchants from the Cossack estate and prohibit girls from ordinary Cossack families to join the Don girls institute. Representatives of the Khopersky district recommended making it available for all Cossack girls (GARO. F. 55. Op. 1. D. 240. L. 64-640b).

Furthermore, poverty should not deprive a Cossack of a chance to receive an education as well. The proposal by the Ministry of War to form military school capital from fees paid by students for taking courses of lectures in the Novocherkassk and Ust-Medveditskaya high schools already before November 1863 split the codification committee which discussed the government draft project of the new "Regulations on the Don Host." Some of its members spoke against the education fees and demanded that they be lifted. The Khopersky district deputies unanimously supported this decision, offering to preserve free education (GARO. F. 55. Op. 1. D. 240. L. 75).

Thus, Kh.I. Popov and other elected delegates from the Khopersky district stanitsas sought to make the network of Don educational institutions as accessible to all Cossacks as possible. However, many of the measures proposed by them can hardly be considered as beneficial. For example, the introduction of tuition fees in high schools was an absolutely necessary step, and besides it by no means affected economically disadvantaged students. The reason is that salaries of high school faculties in the Russian Empire were acknowledged as inadequate by the Ministry of Education itself, and to address this problem, it was permitted to charge wealthy students 5-10 rubles in silver annually. The money was then divided between teachers and the poorest pupils (Artinsky, 1907: 187). The Novocherkassk high school, almost the only one in the Empire, had not such tuition fee in place, and the education was free here, but its teachers were forced to engage in additional private lessons or look for other ways to earn for the life. The Ministry of War made efforts to deal with the situation using commonly accepted practices, by introducing a tuition fee in the amount of 5 rubles per year in the Novocherkassk high school since 1861, and immediately stipulating that poor students would not have to pay the fee, but they would receive part of the collected money (Artinsky, 1907: 187). However, the Don society viewed this decision very negatively. High school director S.S. Robush complained in 1863 that "The tuition provokes discontent here, and not only among the undeveloped class, but also in more educated circles. Complaints about the high school's administration of its charging fees from students were filed with the Appointed Ataman by such people for whom it was not a great burden at all to pay 2 rubles 50 kopecks in silver per semester for their sons' studies, but who saw some kind of infringement of their own *privileges* in this charge (italics added by S.S. Robush – A.P.)" (Artinsky, 1907: 187-188). But in another case, the deputies from Khopersky district clearly demonstrated double standards. We noted above their demand that all Cossacks be admitted to the school of uryadniks on the grounds that their training was paid for by the entire army, and not only by nobles, but the fact that the Don Institute for Girls was run at the expense of special fees paid by noblemen and compulsory donations from them (Krasnov, 1863: 401), was totally omitted in the text of "The remarks...," which on the other hand contained a recommendation for the institution to accept girls from Cossack families of any background.

Local, but very profound significance can be attached to the proposal specified in the "The remarks of the deputies, appointed by stanitsas of the Khopersky district, on the proposed main provisions of the Regulations on the Don Host," which offered to redefine the principles of the medical education on the Don. The Russian historiography features a dominating opinion that traditional folk medicine quite successfully replaced professional medicine for Cossacks. A recently published textbook on the history of the Don Cossacks says, for example, the following: "Being at the crossroads of civilizations, Cossacks created a unique natural pharmacy, devised methods and ways of treating wounds and diseases, tested and secured medical knowledge in experience and a distinctive conceptual system. <...>. Herbalists and healers cured wounds from gunshots, stabs and cuts, sore throats, fever, insomnia, hernias, hiccups, lichen, splenic fever and many other diseases" (History, 2008: 292). A more cautious stance on the subject is taken by V.G. Vasilenko who devoted her scientific work to the history of healthcare and medical education in South Russia. According to her, folk medicine was not a panacea, but it had its positive aspects – some of its developments remain relevant even today, and even after professional doctors started to practice medicine, Cossacks not just continued to visit healers, but at times preferred them to qualified medics (Vasilenko, 2005: 24-29). On the contrary, S.V. Solovyeva actually arrives at the claim that Cossacks did not need comprehensive medical institutions and professional doctors were not needed: "For a long time, Cossacks did not feel any critical need for specialized medical institutions. <...>. Each Cossack was a healer of a kind and could always render first aid to his comrade" (Solovyeva, 1995: 60).

And it was not until recent years that the effectiveness of traditional Don medicine has been questioned. A.V. Zakharevich, well-known historian of the Caucasian war, has recently published a paper where he showed that in the early 19th century, the general situation in medicine was bad on the Don (Zakharevich, 2016: 49-71). Having cited numerous statements about the supposedly highest levels of the Cossack folk healing, the modern author set them against real facts, the most revealing of which is the fact that the annual losses of Don regiments from diseases reached 10 % on the Caucasian Line (Zakharevich, 2016: 61). However, later A.V. Zakharevich cast doubt on his own conclusions, and in the next paper suggested that, possibly, documents about the "futile" Cossack folk medicine and its victims were compiled by professional medics of the 19th century who as people with medical education simply… "did not understand what benefits could give some herbs, incantations, etc., as compared to high science" (Zakharevich, 2017: 15).

In the dispute between supporters and opponents of the Cossack folk medicine, the Khopersky district deputies took the side of professional medics of their time rather than the view of modern historians. Moreover, they considered it a serious drawback of the draft future reforms, which had been provided from above, precisely the fact that they failed in principle to somehow address the vital problems of the Don medicine. Meanwhile, Don stanitsas experienced a "dire need" in real medical professionals. Kh.I. Popov and his supporters not only thought that it was possible to make do with healers and herbalists but insisted that every stanitsa of the Don Host should have its own full-time medical attendant (feldsher) (GARO. F. 55. Op. 1. D. 240. L. 80).

But in the context of desperate shortage of people, who received medical education, to formally introduce the positions in stanitsas was not enough. It was necessary to find those who would occupy the offices, and the Khopersky district deputies proposed to organize targeted professional medical training on principles that had not been used on the Don ever before. Again, the very concept of such training was not new and had long been resorted to by the government: in 1860, 159 state-financed places for Don Cossacks were allocated in various educational institutions of the Russian Empire with 6 of them being in medical schools (Krasnov, 1863: 404-405). However, the deputies of the Khopersky district proposed to refuse from a fixed number of vacancies, determined by the imperial and military authorities, and, instead, allow stanitsa communities to send to medical schools as many Cossacks as they considered necessary, and, in return, the studies of such students would be paid from both the military chest and stanitsa budgets (GARO. F. 55. Op. 1. D. 240. L. 80). From our viewpoint, the proposals formulated by the Khopersky district deputies were once again more practicable than the government's ideas. In the early 1860s, the number of vacancies for Don Cossacks in educational institutions did not always correspond to the number of people who were willing to take them. For example, the Mikhailovsky Artillery School allocated eight such vacancies in 1860, and only one was in fact occupied (Krasnov, 1863: 402). On the other hand, introducing the targeted education, sponsored not only by the entire Host, but by other local authorities as well, provided that these authorities could determine an institution for those who wished to apply for, seems to be a viable response to the Don's many problems in the mid-19th century. For example, at that time, the Ust-Medveditsky district struggled to cope with heavy demand for land surveyors, which resulted in the more than decade-long surveying of the land after the peasant reform. It came to almost anecdotal situations. The assembly of Ust-Medveditsky district conciliators had to wait for several years for the military authorities to send a land surveyor to them. As as the specialist never arrived, and the assembly had to look for the required profession independently. And the only candidate found demanded payment in advance, and, after he had got it, he disappeared (GARO. F. 46. Op. 1. D. 1057. L. 3).

We believe that unlike "The note on the Don Host" by A.M. Dondukov-Korsakov who offered quantitative changes, "The remarks of the deputies, appointed by stanitsas of the Khopersky district, on the proposed main provisions of the Regulations on the Don Host" envisioned qualitative transformation of the Don educational system. This document failed to elaborate on the basic Kazakoman idea to expand the network of educational institutions in the Don Host Oblast land and accordingly increase their funding. On the other hand, the Khopersky district deputies considered it necessary to significantly amend the principles themselves, which created the core of the Don education. It was recommended to grant an extended package of rights and privileges to educated Cossacks, which, in fact, singled them out into a special sub-estate along with the Don noblemen and trade Cossacks. The education itself was planned to be made available to all Cossack children as much as possible, and stanitsas were supposed to be given the capacity to

independently allocate funds for targeted eduction of Cossacks, even though only in feldsher schools for the moment. We illustrated that while some of the proposals developed by the Khopersky district deputies were not deeply considered, but other suggestions at least deserved some attention of the Ministry of War. It is not surprising: the deputies from the stanitsas actually were representatives of ordinary Cossacks that supported conservative Don Kazakomans, and their text reflected the position regarding the upcoming reforms, which was adopted by the most population in the Don Host Oblast. Therefore, although the representatives of Khopersky stanitsas gave up to some populist but widespread ideas in the Cossack society, at the same time they managed to voice the underlying needs of Cossacks, which had been missed by the Ministry of War, and to point out which of the governmental regulations concerning education did not work well and were, in fact, half measures.

Unfortunately, in the end, "The remarks of the deputies, appointed by stanitsas of the Khopersky district, on the proposed main provisions of the Regulations on the Don Host" proved to be of no demand in the government. The draft project of the new "Regulations on the Don Host," devised in cooperation with the stanitsa deputies, was rejected, and moreover it was shelved not only at the initiative of the Ministry of War, but of other central bodies of the Russian Empire as well (Volvenko, 2014: 18). And this outcome had its reasons. With the support from the government, the liberal concept of reform in the Don Host differed from the proposals of Kazakomans not in particulars, but in its essence. This was also true to the sphere of education. If conservatives suggested focusing on addressing the most acute and obvious issues, "the real needs of the Don Host," as A.M. Dondukov-Korsakov put it, liberals demanded a complete overhaul of the very pillars on which the Cossack class existed, and expected that the abolition of the most obsolete rights and privileges of the Don Cossacks would eliminate the root causes of existing problems. Accordingly, it was advised instead of developing the network of educational institutions in Cossack stanitsas or changing the legal status of their graduates, to consolidated efforts to deal with the barriers that prevented this network from developing.

In this regard, the position of N.I. Krasnov, one of the most prominent Don statisticians of the 19th century and a supporter of the governmental program of reforms, put forward by the Ministry of War in the early 1860s, is very exemplary. Despite his liberal mindset, the General Staff officer agreed with Kazakomans when he admitted that the crying situation in the Don education slowed the development of the Don Host in general. He wrote: "Education is on the decline, and the backwardness has a disastrous impact on all branches of industry and social activities; all positions that required special knowledge were occupied with people who did not belong to the Don Host class, which, in turn, irritated the Don population" (Krasnov, 1863: 403). However N.I. Krasnov also noted that the "passionate commitment of the Don Host Oblast population to enlightenment" became visible only in 1860, and before that even educated Cossacks did not rush to spread their knowledge, and "there hardly were twenty research papers published by writers from this region (the Don – A.P.) over the last half-century" (Krasnov, 1863: 403). Therefore, according to the Don statistician, potential successes of the Don education were determined not by the developed network of educational institutions or the scope of the rights possessed by their graduates, but by the attitude towards the education of Cossacks themselves. "The doors of enlightenment are open to all comers. It remains to take advantage of the government's reasonable direction and enter the sphere of arts and science. It remains to take advantage of those gifts of nature that have been kept under wraps for so many years" (Krasnov, 1863: 404). It is noteworthy that these words were written almost simultaneously with "The note on the Don Host" by A.M. Dondukov-Korsakov. Thus, when the conservative author demanded specific changes from the government in the Don education, his liberal opponent called on Cossacks to start making use of what the authorities had already done. And this, too, was meaningful: as we noted above, in the early 1860s, part of state-subsided places in educational institutions outside the Host remained vacant. Accordingly, the range of areas that were not in demand, except artillerymen training, included civilian fundamental education. Vacancies in Kharkov University were filled only by two thirds, and there were cases when the Cossacks who wanted to study there were not supported by their own families (Peretyatko, Zulfugarzade, 2017: 371).

But on the other hand, N.I. Krasnov did not absolve the imperial government of the state in which education existed on the Don. However, in his opinion, the mistake of the central authorities had much more serious implications than insufficient funding of schools or excessive

centralization. The Don statistician perceived the situation itself, which arose in the Don Host, as unnatural. This perspective was in line with the government's project of reforms, which was criticized by A.M. Dondukov-Korsakov and the Khopersky district deputies. Here is a key quote from this document, entitled "Considerations of the committee established under the Office of the Irregular Troops regarding the main principles that must be taken into account when drafting new provisions on Cossack troops": "The position of the society is unnatural if all members of such a society belong to the military class which is obliged to have weapons ready at all times and, at the first request, set out on the march in complete equipment and at their own expense" (Volvenko, 2016: 69). N.I. Krasnov not only quoted these words verbatim in one of his works (remarkably, he did it without quotation marks (Krasnov, 1864: 199) but also confirmed them with specific examples, proving, among other things, that the receiving any skills by Cossacks other than the military ones was of little use. "Both hereditary and personal nobles in Cossack communities are even deprived of the right to freely choose the way of life and occupation, before a certain period of service expires, which, being extremely long, ends only when Cossacks due to their advance age, are not able to devote themselves to some professional occupation. As for Cossacks of the lowest estate, only the most limited number of them is able to engage themselves in trade, manufacturing and crafts" (Krasnov, 1864: 198). And the government's project of reforms was aimed precisely to correct this situation. To support this, N.I. Krasnov also quoted another statement from the document, even though he did not put quotation marks again (Krasnov, 1864: 199): "It is possible to ameliorate this false position, in which the Cossack population has to live, only by limiting the military estate to a certain size, so that the excess of the Cossack population would be exempted from conscription even in case of emergencies, and continuing to be citizens of their land could freely turn to other occupations" (Volvenko, 2016: 69). Accordingly, the Don statistician believed that the project of reforms, proposed in the "Considerations of the committee established under the Office of the Irregular Troops regarding the main principles that must be taken into account when drafting new provisions on Cossack troops," was designed to enhance "civic consciousness and *education* (italics added by me – A.P.)" in the Cossack troops (Krasnov, 1864: 196), although its further detailed analysis by the Don statistician did not mention a single proposal on education (Krasnov, 1864: 196-210).

However, while acknowledging that since the early 1860s, the Ministry of War took the right direction by gradually rectifying issues of the Don education, N.I. Krasnov did not agree with the principles which, according to "Considerations ...," were intended to be employed to exempt part of Cossacks from service. We will not review these principles in detail but will only emphasize that they, as the concept of Don Host citizens" implemented later in the Cossack troops, provided no benefits to the educated Cossacks. The vision outlined in the government's project of reforms specified that any Cossack, regardless of education and financial situation, would be able to refuse from military service (Krasnov, 1864: 204), but he would lose the right to receive a land share (Krasnov, 1864: 199). N.I. Krasnov considered this proposal inexpedient and criticized it expressing thoughts that were surprisingly close to the ideas of the Don Kazakomans and, especially, to those offered by Kh.I. Popov. The General Staff officer stressed that "the Don people consider the land right to be of the greatest importance among their rights," and fewer Cossack allotments "will arouse secret murmurings of displeasure" (Krasnov, 1864: 208). On the other hand, N.I. Krasnov expressed hopes that the government had initiated the reforms to ease the situation of Cossacks, and not to replace their service with another one "more profitable for the government" (Krasnov, 1864: 207). For this reason, the Don statistician advised the Ministry of War to exempt part of Cossacks from the conscription, without violating the major privilege enjoyed by the Don Host and reserving land for them. But the right to be exempted from military service should not be granted to all those who wished to have it, but only to certain categories of Cossacks, which in the second place, after people who were ready to pay compensation for the release from conscription, should include "specialists of various sciences and arts," that is, people , who received education (Krasnov, 1864: 204). Thus, in the early 1860s, public figures of the opposite camps called on the Ministry of War to directly link the receiving education by Cossacks with their release from compulsory military service in order to give individuals of the military estate who accomplished a high school or university course the opportunity to fully put their knowledge in practice. It remains only to regret once again that these calls were not heard.

4. Conclusion

The projects of reforms for the Don national education, put forward in the early 1860s, constitute an interesting area for scientific scrutiny already because they clearly showed the fundamental differences between Don liberals and conservatives. Kazakoman conservatives believed that only consistent transformation could be successful, and to ensure the well-being of Cossacks, it was necessary first to deal with the vital issues of the Don region, including those related to education. They proposed that the government focus on specific changes, which brought obvious benefits, such as expanding the Don network of educational institutions, introducing incentives for Cossacks to choose the education in them, as well as linking professions of graduates with actual needs of the Don Host. Progressist liberals, on the contrary, argued that the Cossack community was unable to normally progress not because of some unfortunate legal provisions, but because of the very archaic essence of the military class. No consistent reforms that left this essence unchanged could be fully efficient. For example, to increase the number of educated Cossacks, it was not enough to open new secondary and high schools, but it was crucial first to exempt part of the Don's military population from service so that people who received a civil education could realize their potential as civilians. It may seem that liberals and conservatives saw eye to eye on some practical questions, opposing projects based on the Don realities to abstract ideas of the government: for example, the Don public figures of the opposing camps considered it wrong that the Ministry of War planned to exempt part of Cossacks from military service but did not try to connect this exemption with the education received. But the point is that this similarity was of a practical nature, while their ideologies were entirely different. In the above example, Kazakomans offered to give the right to conscription exemption to graduates of higher educational institutions, so that a small, not fixed number of Cossacks who had already demonstrated their abilities in the civilian area, were released from military service. The number of such "Don Host citizens" would grow in a natural way, and this process should only be accelerated through encouragement and more available education on the Don. Unlike them, Progressists proposed to immediately release from service a significant part of the local population which would include only a small proportion of educated people. According to liberals, this roadmap would greatly contribute to the faster development of Cossacks, including their advancement in education, since the skills, obtained in secondary and high schools, would be much more appreciated in the civilian environment than in the military one. This, in turn, would inevitably strengthen the "passionate commitment of the Don Host Oblast population to enlightenment," which formed in the early 1860s.

Despite such ideological differences between Don liberals and conservatives, the proposals by Prince A.M. Dondukov-Korsakov can be regarded as a kind of minimum agenda for the Don education, which should be necessarily implemented, and the necessity was clear to everyone. A.M. Dondukov-Korsakov offered no qualitative changes but limited his initiative to technical requirements which sooner or later would have to be fulfilled in any case. The Chief of Staff of the Don Host considered it imperative to construct a separate building for the Novocherkassk high school, establish a new high school in the up-river districts, from where it was difficult to send children to study in the administrative center of the Don Host Oblast, and to expand the network of stanitsa schools, which was inadequate even by Russian standards. Although this program was of a universal nature it was only logical that it was put forward precisely by a Kazakoman, a representative of the party whose members spotlighted the need to tackle obvious and burning issues of Cossacks.

Unfortunately, more ambitious projects involving qualitative changes in the Don education were implemented, primarily because conservatives and liberals were locked in the political struggle. No special rights were granted to educated Cossacks either in the Progressist version or in the Kazakoman variant. Meanwhile, even such implacable ideological opponents as N.I. Krasnov and Kh.I. Popov share one view that members of the military estate who graduated from higher educational institutions should be exempted from military service to receive a chance to build civilian careers. But the Ministry of War failed to hear the Don public figures. It is illustrative that during the military reform of the 1870s, educated Don Cossacks received only part of the privileges that were due to representatives of other estates in the Russian Empire, and the total term of military service was stipulated for them on general grounds (RGVIA. F. 330. Op. 61. D. 1937. L. 43-43ob). Our conclusion is that this unwillingness of the government to support educated Cossacks, and the fact that even basic privileges that had university graduates from other classes were

unavailable to them, are the root causes explaining why in the 1870s, the growth in the number of students on the Don slowed dramatically, and the traditional aspirations of the Don Cossacks to education were not fully used.

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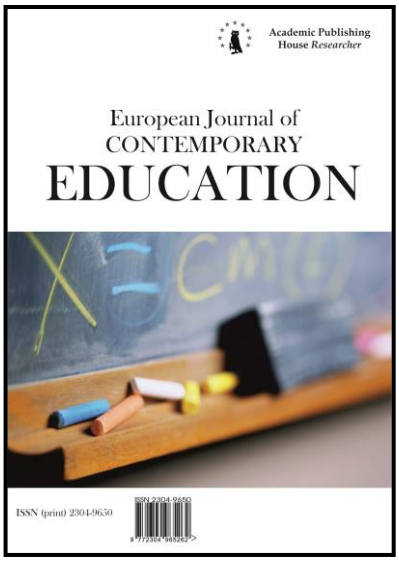

Sending Scholarship Students Abroad in Ottoman Empire

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Abstract

The implementation of sending scholarship students abroad that started in the 19th century by Sultan Selim III in Ottoman Empire continued during the period of other Sultans became a significant reference point for the abroad scholarship policy of Turkey. The students that were firstly sent abroad especially for military training, were sent to other countries such as France, Germany, Switzerland, Austria, Prussia, England, Belgium and Russia so as to have an education in various areas in the following years. In this paper, the legal arrangements for choosing scholarship student's selection process, rights, and obligation are dealt. Then, national and international factors that triggered sending scholarship students abroad are addressed in order to have a wide understanding of the implementation process of the scholarship program. Finally, the achievements of the Ottoman Empire due to the success of scholarship students are put forth by examining the study areas and countries of the students.

Keywords: Ottoman Empire, Abroad Scholarship, Scholarship Policy Analysis, Public Policy, Public Policy Analysis.

1. Introduction

1789 French Revolution prompted significant changes across the Ottoman Empire as well as most of the countries in the relevant period. In other words, changes and developments in European continent in economic, political and social aspects influenced public policies of the Ottoman Empire in numbers of areas. Novelties and advancements as well as scientific institutions observed by bureaucrats, intellectuals and politicians during their visits to European Countries, were considered as indicators of underdevelopment of the Ottoman Empire (Berkes, 2003: 56), and modernization process gained pace in all aspects of the society (Karpat, 1996: 20). Westernization movement was first initiated in the military domain and the Guild of Janissaries

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maintained as the backbone of the armed forces of the Ottoman Empire afterwards of the 14th century was abolished and fundamental change in military policy became an official program under modernization movement (Tanpınar, 1997: 64).

Modernization movement spread from military domain to other areas and especially crucial steps were taken in the education area. Education deals with raising individuals for public targets by taking social needs into consideration. As a substantial emphasis was placed on education in the Ottoman Empire in the modernization period, western style educational institutions were founded by abolishing outdated conventional schools incompetent in providing an adequate education. Modern education was initiated by establishing new educational institutions such as "*Mekteb-i Maarif-i Adliye*", "*Mekteb-i Ulum-u Edebiye*" and "*Rüştiye*" (Özodaşık, 1999: xi-26). Additionally, various other schools were founded such as "*Mühendishane-i Bahri Hümâyûn*", "*Mühendishane-i Berr-i Hümâyûn*", "*Mülkiye*" and "*Tıbbiye*" to launch fundamental changes in education. Nevertheless, due to the lack of faculty members in these institutions, it was not able to provide quality education to students and the target of raising qualified and competent students failed to a large extent (Erdoğan, 2010: 124).

Social needs emerge by various problems so that they could be fulfilled by policy makers. Similarly, in the Ottoman Empire, numbers of problems occurred afterwards of ends of the 18th and beginning of the 19th century. Finally, this situation urged administrators to send students to abroad under scholarship programs. Prominent problems emerged in the concerned period could be listed as follows: the lack of competent professionals who could be employed in the administrative departments of the Ottoman Empire capable of speaking foreign languages (Özodaşık, 1999: 25-26); insufficient number of military officer at the army; need for qualified labor who could be employed in the new industrial facilities along the industrialization process; and need for professional diplomats for developing international relations. These factors were considered as the ones driving the Ottoman State to initiate a policy which includes sending students abroad under scholarship programs (Erdoğan, 2009: 4).

2. Legal regulations

The Sultanate Edict of Reforms promulgated after 17 years from the declaration of Imperial Edict of Gülhane constituted a fundamental ground for the practice of the scholarship program such that it was included in the edict that students would be sent abroad for education purposes under a scholarship program and all expenses will be compensated by the Ottoman Empire. Accordingly, it was mentioned that 11 students for each of the ministries of Foreign Affairs, Internal Affairs and Commerce, and 10 students from each of the educational institutions called "*Mekteb-i Harbiye*" and "*Mühendishane-i Hümayun*" were to be sent (Aslan, 2014: 32-33). Thus, the practice of scholarship for studies in abroad was contained in the Sultanate Edit of Reforms and this laid down the ground for the relevant future legislation. Although this student scholarship program was maintained until 1914 when the Sultanate Ordinance referred as "*Memalik-i Ecnebiyeye Gönderilecek Talebe Hakkında Nizamname*" which regulates the scholarship program, it was not executed as planned; and the eligibility and scholarship terms were not pronounced clearly in detail. However, the explicit expression of the public policies and programs plays a functional role in the success of the implemented policies (Birkland, 2005; Dye, 2008; Matland, 1995; Spillane et al., 2002).

Aforesaid Ordinance ensured the evolution of the Sultanate Scholarship Program into a systematical practice in the pre-Republican period. This Ordinance set objectives of the Program, student selection criterions, administration of the exam, benefits to be offered to students, obligations and liabilities of students and education plans (Aslan, 2014: 32-33). In this context, articles took effect following the legislative process in the form of Sultanate Ordinance. Sultanate abroad education scholarship for students was implemented on the ground of Law referred as "*Memalik-i Ecnebiyeye Gönderilecek Talebe Hakkında Nizamname*" until the proclamation of the Republic of Turkey in 1923 within this framework.

In order to monitor education and learning status of students sent abroad, the Directorship referred as "*Talebe-i Osmaniye*" was founded in 1869. This Directorship especially supervised the status of scholarship students sent to France (Şarman, 2006: 3-6). The Scholarship Program ceased in the period of Sultan Abdülaziz was resumed in the reign of Abdülhamit II. during which 423 students accessed opportunity to have education in abroad by means of the Sultanate

Scholarship Program. While scholarship students were sent to France, Germany, Switzerland, Austria, the Great Britain, Belgium and Russia, they were mostly sent to France and Germany in the period of Abdülhamit II. It was seen that 389 students out of 423 students studied either in France or Germany. On the other hand, the number of scholarship students studied in the Great Britain and in Russia was reported totally as 10 (Gençoğlu, 2014: 33-37). Scholarship students in the period of Abdülhamit II studied in the majors needed by the departments of the country such as military, medicine, agriculture, engineering, law, veterinary, chemistry, political sciences, architecture, fine arts, painting, music, sculpture, dentistry, economics, pharmacology, natural sciences and tile art. Although it seems that there was a wide variety of education majors studied by scholarships, more than half of them studied in military and medicine majors (Gençoğlu, 2014: 40).

The reign of Abdülhamit II is seen to be one of the most effective periods of the Sultanate Scholarship Program in the Ottoman Empire. In this period, students were required to fulfill certain pre-conditions to be eligible for their acceptance to the Program; and students were selected within this framework. These conditions were listed as student's age, health status, criminal records, and language skills in Turkish and French. In this context, candidate students for the Program were expected to be in the age range of 20-26; to have a good health condition to be employed in public institutions; have no criminal record, and have good command in foreign languages especially in France. Students found eligible for the Sultanate Scholarship Program were paid monthly allowance and their travel expenses were compensated. Scholarships who failed in their education programs or who did not accommodate to instructions of the student supervisors from the Directorate were dismissed from the scholarship program and all expenses made the by the Government were collected from guarantors of students. Students who completed their education successfully were entitled to work for various public institutions for minimum 10 years. Graduated scholarships students who reject to work for a public institution or who resigned before the compulsory service period were entitled to paid compensation (Gençoğlu, 2014: 40).

3. Implementation of the Abroad Scholarship Policy

Implementation of the public policies is highly crucial in order to reach the set goals. In this significant stage of the policy, various factors such as social, economic and political have an impact on the success of the implementation (Howlett, Ramesh, 1995: 155). Thus, the policies made the by the public bodies should be implemented effectively and efficiently (Edwards, 1980: 1). On the other hand, the support of the public is overwhelmingly functional for the smooth implementation of the public policies (Anderson, 2014; Gosling, 2004; Peters, 1996; Ringquist, 1993). The first student, *Ishak Bey*, was sent abroad by means of the sultanate scholarship for diplomatic language education in France in the period of the Selim III in the Ottoman Empire (Unat, 1964: 129). Furthermore, some of the students attending the educational institution called "*Harbiye ve Hendesehane-i Amire*" in the Mahmud II period were sent to Europe by sultanate scholarship (Ayas, 1948: 689). In general, students sent to Europe in the Ottoman period were specialized in foreign languages, education planning and military education as well. However, it is also reported that a substantial number of students were sent to France for Carpentry, Tailoring, Iron Smith and Modeling training (Şişman, 2004: 86). In the period of 1839-1876, demographical distribution of student sent abroad on the Sultanate Scholarship Program was that 71% were Muslim, 29% were non-Muslim students such as Armenian, Greek and Bulgarians (Şişman, 2004: 85). Although there were opponents of this scholarship program initiated in the period of Selim III, it was maintained and extended in the periods of Mahmud II and Abdülmecid as well (Şarman, 2006: xx). Nevertheless, as a result of the opponent stance of individuals who were once sent abroad against the administration, the Sultanate Scholarship Program was ceased in the last quarter of the 19th century. Afterwards, students were ensured to have education in Istanbul, the capital city of the Empire (Unat, 1964: 15). Yet, the budget reserved for the Program was steered to establish new schools such as Galatasaray High School, one of the most reputable institutions even today in order to provide quality education to students (Şişman, 2004: 86). With the onset of the Second Constitutionalist Period in 1908, a number of scholarship students elevated once again and students were encouraged to pursue various academic majors along the country needs.

Male students were sent to abroad to supply teacher needs of modern educational institutions such as "*Darülmuallimat*" restructured and transformed in Tanzimat Reform Period in

Ottoman Empire and which undertook to raise modern teachers for the country. Furthermore, women were sent to abroad on scholarship for studying majors of fine arts, painting and sculpture due to lack of institutions for these majors in the country and they served significant duties after their return (Çolak, 2013: 20). Thus, women gained the seat in the modernization process of education in the final decades of the Ottoman Empire. The Education Law numbered 1416 enacted in the Turkish Republican period with the title of "Students to be Sent to Foreign Countries" was considered as the reference point.

In the beginning of the 20th century, even though scholarship programs for sending students abroad are embraced as government policy, various segments of society raised concerns about social dissolution because of this practice. For instance, Mehmet Akif Ersoy, the author of the Turkish National Anthem, remarked his concerns, criticism and considerations about scholarship programs for sending students abroad in his second book with the title of "*Safahat*" written in 1912 (Düzdağ, 1987: 151). He stated that "then our people in prosperity said that 'Go and get science' and put some Ruble into the pocket of everyone who requests and sent them to Europe; my countrymen were so generous indeed. The majority of those who were gone really studied their major. But, some hangdogs among them were enough to stain their reputation... How regretful of those who sent those ones!" Opinions and constructive criticism outlined by Mehmet Akif Ersoy in his book called *Safahat* were fundamental for legislation of the Law No. 1416 which took effect in 1929 and considered one of the most rooted laws of the history of the Republic of Turkey.

Results of the Ottoman Empire Scholarship Program for the education of students in abroad emerged in the beginning of the 20th century. For example, İsmayıl Hakkı Baltacıoğlu who was sent abroad through this Program for education in Pedagogy major education contributed to innovation and change in the education system in the country (Aytaç, 1987: 111-115). Thus, it is possible to claim that such contributions of the students sent abroad for education in the Ottoman era to the country in various domains paved the way to bring the Law No. 1416. On the other hand, Satı Bey, one of the prominent senior teachers of the relevant period, mentioned appropriate exam questions that could be utilized for selection of students for the Scholarship Program in his book called "*Layihalarım*" written in 1910. The author criticizes the practice of Scholarship Program for being non-systematic; student selection process is fast, superficial and inadequate to measure the competency of students. Satı Bey also emphasizes that selected students were not able to acknowledge decently the significance and preciousness of this Scholarship allocated to them (Ünal, Birbudak, 2010: 86-87).

4. Achievements

In the pre-Republic period, non-Muslim women were sent to Geneva, Paris, Versailles and St. Petersburg for their education in various fields such as Music, Art Crafts, Painting, Piano, French and Medicine by the Ministry of Education long before Muslim women (Çolak, 2013: 45). After the onset of the scholarship program for non-Muslim female students, the same opportunity was considered for Muslim female students as well and various opinions were drawn. Although there were social segments against sending Muslim female students abroad, the same opportunity was given to Muslim female students as the ones made available to non-Muslim women. However, while some Muslim female students experienced difficulties introduced by the World War I and either dropped off their education programs before graduation or continued in other locations, some others were influenced negatively by conditions of the relevant period and failed in their graduate studies. For instance, Belkıs Bekir who was studying in Paris had to change the host country because of the War circumstances which led her failure in the education program. Then, her subsequent psychological breakdown dragged her into a suicide (Çolak, 2013: 64-66).

The majority of female students participated in the Sultanate Scholarship Program during World War I were preferably sent to Germany, one of the allies of the Ottoman Empire in this period. These students who studied in important cities of Germany gained proficiency in various majors. Some of the students studied in Germany during the period of World War I were introduced below with their respective professions (Çolak, 2013: 78-79); Safiye Ali (Medicine), Efzayiş Yusuf (History, Literature, Philosophy), Fazıla Fazlı (German), Belkıs Mustafa (Painting), Bedriye Şükrü Kamil (Medicine), Hatice Suat Derviş (Music), Şaziye Hayri (Philosophy), Nimet Kazım (Dentistry), Safiye Sami (Philosophy), Namiye Neşe (Medicine), Nebahat Nihat (Pedagogy), Mükerrem Hasan (Music and Tailoring), Rafet Süreyya (Piano), Mediha Rıfat (Piano), Emine Müzeyyen (Tailoring), Zehra

Hakkı (Tailoring), Mediha Süleyman (Music), Sıdıka Sabiha (Language), Havva Feriha (Violin, German), Atiye Murtaza (Language), Semiramis Ekrem (Medicine).

In the pre-Republic period, it was aimed to supply the country's need for competent and skilled labor through the aforesaid Sultanate scholarship policy for studies in abroad. In line with this target, students were sent to various European countries to have education in majors with priority. In spite of the shortage of women doctors in the concerned period, female students were not accepted to "*Darülfünun Faculty of Medicine*" and medicine schools started to enroll female students by 1922. Accordingly, education in abroad was a necessity for Muslim female students whose target was practicing medicine in the late period of the Ottoman Empire and beginning of the Republican period (Atıcı, Erer, 2009: 108-109). Thus, Muslim female students were sent abroad for education in medicine major by the Ministry of Education. Selected students were sent to countries such as Germany, the Great Britain, Switzerland and the US where appropriate medical education was provided. Consequent of successful administration of the scholarship program yielded the first women doctors in the Republic of Turkey and made significant contributions into the medical domain. Additionally, prospect female teachers were accepted into the scholarship program so that they could receive education in necessary teaching majors in abroad. First, selected female students gained the chance to have education in prioritized majors such as French, Piano and Painting determined by the Ministry; then, in the majors of Medicine and Dentistry along the following years within the scope of the scholarship program (Çolak, 2013: 81-83).

Students from various constituent nations of the Ottoman Empire were accessed chance to have education in abroad without incurring any discrimination in the pre-Republic period. In post-Sultanate Edict of the Reform period, the importance attached to the scholarship program increased and more students were sent to abroad for their education in various fields. Students who studied in abroad were assigned to substantially important government positions after their return to the country. For example, well-known names in the Literature, Medicine, Physiology, Plastic Arts and Painting were among the students who were educated in abroad within the scope of the Sultanate Scholarship Program. Furthermore, the first museum director and the first curator of painting exhibition was Osman Hamdi Bey, one of the scholarship students educated in abroad in the Program. Scholarship students also succeed to climb up to the top administrative positions in the Empire after their graduation; they even were assigned as grand vizier, viziers and ambassador. Students who were sent to France on scholarship program in the period of 1839-1876 assigned to the important positions afterwards of their graduation. In the mentioned period, students educated in France served country at highest public executive, legislative, military and administrative positions as well as fine arts, medicine and engineering such as Chair of Higher Legislation Council, Governor, prefect, Minister of Foreign Affairs, Undersecretary, Minister of Navy, Minister of Health, Minister of Commerce, Minister of Finance, professors, engineer, ambassador, Sultanate Doctor, Minister of Education, painter, archeologist, poet, writer, author and controller (Şişman, 2004: 85-156).

5. Conclusion

Similar to a number of other underdeveloped countries, sending students abroad for education under Government Scholarship Programs is one of the essential subjects in the history but it has not been publicly debated adequately. While aforesaid Scholarship Programs were launched during the reign of Selim III in the pre-Republic period, it gained pace during the reign of Abdülhamit II. Later on, these programs were maintained in the Republican period and they were transformed into a formal functional shape upon taking the Law No. 1416 in 1929. These programs yielded an opportunity of a window for development of Turkey. At the beginning, scholarship students who sent abroad were placed at the military major. Although this was a brand new program at this period, an important strategy was developed and the directorship referred as "Talebe-i Osmaniye" was founded to monitor statuses of scholarship students in abroad. Thus, in the economic distress period of the Ottoman Empire, it was aimed to take the resources reserved for the Scholarship Program advantage effectively. Especially, students sent to Germany, France and Prussia under the scholarship program were studied a wide variety of majors ranging from Dentistry to Political Science, Architecture and to Veterinary. That way, the professions necessary for the current period were successfully determined by considering conditions and scholarship students were sent abroad for their respective education.

When the reign of Abdülhamit II is considered with respect to overall the Ottoman Empire period in terms of practice of Sultanate Scholarship Program, it could be seen that the Program was maintained effectively; and significant steps were taken in both selection of scholarship students and determination of code of practices to be applied to students with respect to their success levels. For instance, requirements for students such as age groups, health condition, criminal records, language skills in Turkish, French and some other languages were determined so that most suitable students could be sent abroad for education. Hence, language requirement for applicants was made compulsory, which is even today not included among the requirements stipulated by the Ministry of Education for Scholarship Program made available for the education of students in abroad. On the basis of student supervisors commissioned in abroad for monitoring their academic success, failed students were dismissed from the program and recalled back to the country. All expenses incurred for the failing students were collected from them so that scarce economic resources of the Empire could be utilized efficiently. The students who completed their education programs in abroad successfully and returned to the country were obliged to participate in public service for 10 years regardless of their duration of education. Hence, students who were sent abroad by making great sacrifices by the public resources were tried to be utilized for the country to the greatest possible extent.

In the pre-Republic period, female students were accepted into the scholarship program and sent abroad for study as well as male students. While non-Muslim female students were sent to abroad first under the scope of the scholarship program, then the inclusion of Muslim female students into the program came to the agenda and different opinions from various segments of the society emerged concerning their travel abroad. Muslim female students acquired a chance to have education in abroad on the contrary to the opposition of some leading names of the period. As women doctors were needed in the pre-Republic period, various strategies were considered. The fact that "*Darülfünun Faculty of Medicine*", the prominent and sole medical school of the period, was not enrolling female students into the faculty was required female students to be sent abroad for their education in Medicine major. Yet, female students sent to Germany, the Great Britain, Switzerland and the US became the first Turkish women doctors who served to the country after their graduation.

Within the framework of the scholarship policy for study abroad in the Ottoman Empire period, successful and qualified students from all segments of the society were accepted into the program and sent abroad without being discriminated. Especially in the post Sultanate Edict of Reform period, more students were accepted to the scholarship program without any religious-based discrimination in parallel with increasing significance of education. Consequently, successful results were gained as a result of the scholarship policy followed; and leading individuals from the areas of Literature, Medicine, Physiology, Plastic Arts and Painting were originated among the scholarship students sent abroad. Additionally, employment of graduated scholarship students at the positions in various ministries in the pre-Republic period evidenced the successful results of the aforesaid scholarship program. In fact, individuals who participated in scholarship program were assigned to top administrative positions of the executive Ministries of Foreign Affairs, Health, Commerce, Finance, Education and Navy. Thus, in spite of disadvantaged economic conditions of the pre-Republic period, scholarship program for education in abroad was maintained efficiently and yielded remarkable consequent success.

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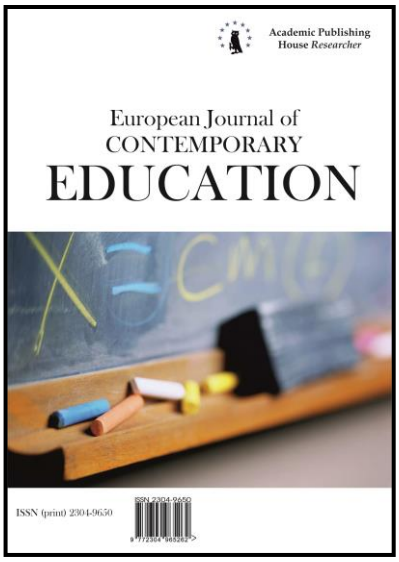

Family and School in Russia at the Beginning of the 20th century: Attempts to Bridge the Gap

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Abstract

Having made an attempt to study the interaction level of the family and school in the late imperial Russia, the author has focused on parent organizations, as the latest and most fruitful way to carry out such contacts, by using publicistic writings on teaching science, school records and periodicals, as well as reference documentation for this task. The issue is revealed through the theory of modernization, theory of bureaucracy, sociocultural and gender approaches. By the beginning of the 20th century, due to the almost complete nationalization of the Russian secondary school, the family's interaction with the educational institution their child was studying at was quite indirect and sporadic. During the Russian Revolution of 1905, the state was forced to legitimize parent organizations that had already become reality, considering them as a mechanism for appeasing students. The post-revolutionary decline of the social movement also led to the decline of the parent organizations' activity, in particular, lowering the number of parents attending the school meetings. This was used by the government as it introduced a quorum for the establishment of parent committees, justifying that by the need for a broad representational scope; as a result such committees were kept only in 1/5 of all the secondary schools. Parents' absenteeism was the result of the disappointment in the effectiveness of these bodies as they obviously lacked any rights as well as the change in the way of life of the townspeople whose pace of life significantly increased during that period. However, privately run commercial schools, usually being more liberal, had started interaction with parents before the revolution, continued and developed it afterwards, especially thanks to students' mothers, who mitigated possible contradictions between parent organizations and schools. As a result, in commercial schools, the family representation managed to actively expand its activities, gradually becoming one of the actors of the school environment. These positions were enhanced during the re-establishment of parent organizations

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in state school, thus turning the commercial schools parent committees into one of the real forces of in-school management.

Keywords: Russian Empire, educational reforms, family, high school, commercial school, parental committee.

1. Introduction

The state-oriented nature of the Russian secondary school, concentration of public education in the hands of the state (Milyukov, 1897: 364) had in the 19th century already turned educational institutions into a part of the bureaucratic machine serving the interests of the state. It is due to this that the church became one of the mechanisms of the educational policy, while both society and the family were virtually made "out of school". Interaction between the family and school in the post-reform Russia was limited to a small number of ways as follows.

First, parents got in contact with the school at the stage of the submission of the admission application along with accompanying documents followed by exchanging letters or meeting face-to-face after the introductory tests. It was due to the fact that there was a certain selection process of those who had passed the exam since the competition was tough because of a limited number of vacancies. In this situation, parents would "jump over" the school authorities, referring directly to the more senior ranks. Thus, "in view of the terrible competition" upon admission to the Technological Institute in St. Petersburg, requests and pleas for admission went directly to N.P. Bogolepov, the Minister of Education. Those were from parents as well as people directly involved in the applicant's life, such as the former St. Petersburg mayor V.A. Rat'kov-Romanov, later a senator, and even certain members of the Royal House (RGIA, F. 741, Op. 1, D. 2, L. 165, 190). The school also was to inform parents or guardians should the student be expelled.

While the student was studying, the school was to inform their parents or guardians on the student's behavior and assessment marks. A commonly used means of such notification was the so-called "ball'nik", i.e. a sheet or booklet, in which one could see the assessment marks for the behavior and studies indicated in numbers according to the scoring system adopted by the school (usually one to five points), and sometimes, a brief note was made if need be. The ball'nik was handed to the student to give that to their parents who were to sign it, which testified that they had read it; then the student was to show the document to the school authorities. Parents of commercial schools students were informed by using diaries or information sheets issued weekly, twice a month, three and four times a year. Special information was sent mainly to the parents of low-performing students (Glagolev, 1904: 50).

Direct contacts between the family and school were carried out provided the student had committed a serious violation of discipline or because of their poor progress (Materialy, 1901: 58).

Payment for school education was, perhaps, the final aspect of the family's connection with the state-run school. That included purchasing books and school uniform. In the state-run school, whose funding came from the government, its tuition fees became the special funds of the educational institution that were allowed to be used at its discretion within the limits of the law. In a privately operated school, these funds became a part of the main budget and at the peak of the development of an educational institution could account for over a half of its revenues and even cover almost all of its expenses (Godovoi otchet, 1915a: 42-43).

Out-of-school supervision of students was a part of the duties of the inspector and the staff supervisors (educators) of educational institutions. However, as P. Strakhov, a teacher working at that time, noted, the practice was somewhat different: "while focusing all their attention on the first [low-performing students and students sharing apartments - T.M.], the teacher has to involuntarily ignore the rest (of the students) ["exemplary students as well as students staying with their parents" – T.M.] both in class and during the extracurricular time" (Strakhov, 1899:63). This conclusion is confirmed by M.I. Fisher, "Headmasters and teachers usually know well only the parents and relatives of those students, who are fail to meet the behavior or assessment standards" (Fisher, 1912: 18). The Teacher Committee of the Saratovskoye Commercial College (SarCC) even explicitly made parents responsible for "observing the out-of-school behavior of their children" and "the due school attendance of their children" (Godovoi otchet, 1907: 69). This was another step to further reduction of already limited opportunity for communication and rapprochement between the family and school.

Formalized contacts were carried out through the general participation of parents and school

staff in ceremonial events at educational institutions, exhibitions and matinees organized by those institutions, though it seems that the main parents' role as of passive spectators as well as the very solemnity of the moment prevented from discussing the burning issues of educational.

It was only at the beginning of the 20th century that the Ministry of Education (ME) realized the necessity to enhance work with the students' families. The reason for this was the growth of the student movement. However, even during that already troubled time the ME's activities were limited to issuing recommendations to teachers and the educational authorities that they should provide more information to the family on the student's misbehavior, as the family "could become the most influential ally of the school contributing to the student's correction" (RGIA, F. 741, Op. 2, D. 243. L. 16).

A narrow range of usually indirect and very limited contacts could not always satisfy society and the parents themselves. The parents' urge for self-organization and coordination was expressed in the activity of family-and-pedagogical circles. With the start of the Russian Revolution of 1905, at the Kazan family-and-pedagogical circle, a circle of parents of secondary schools students was established, which operated until February 1906, when parent committees were finally formed in all secondary schools (Kratkii istoricheskii ocherk, 1914: 33-34).

2. Materials and Methods

2.1. Due to its conservatism and traditionalism, school management records that represent aspects of regulation of the relationship between the school and family at the local level and statistics on parents' financial assistance contain little information on the way parents took part in the life of educational institutions. Pedagogical journalism, represented by articles in all-Russian journals and popular essays, contains consistent information on the development, problems and contradictions in the development of parent organizations, their place in the Russian education. The local press makes it possible to identify the organization and issues discussed at parents meetings. Reference documentation is a source for tracing the policy transformation as well as determining the legal basis for the interaction of the family and school.

2.2. The formation of parent committees is seen as a complex and questionable element of modernization, being in contradictory relations and sporadic conflicts with the state-run school, viewed in the context of the bureaucratic theory as an organization that long lost its flexibility in interacting with the environment. This discord was also seen in the context of the sociocultural approach, which, along with attention to the gender factor in parent organizations, presented them as actors in changing school life.

3. Discussion of the issue

As the relations between the family and school were quite a burning issue, pre-revolutionary historical and pedagogical literature paid much attention to that. In a large number of works written by Russian teachers, the need for a more complete unity of the family and school was seen as an important factor in solving the problems of the Russian school (Kapterev, 1914: 120-143). A smaller number of works expressed a more balanced approach, aimed at protecting the autonomy of the education system from the family intervention but allowing mutual contact of parents and teaching staff at the individual level (Charnoluskii, 1909: 47-49).

Soviet historians considered the parent committees issues mainly in the context of the events of the Russian Revolution of 1905 and the political history of education, focusing on the stiffening of the post-revolutionary reactionary regime (Konstantinov, 1956).

It was the modern historiography that brought up a significant issue on the effectiveness and necessity of parent committees in secondary schools. Thus, I.V. Zubkov explains a more active administrative interference in the activities of parent committees by referring to particular cases of conflicts between headmasters and parent organizations and the opinions of administration members of individual schools who talked about an unsystematic way of work, poor attendance of meeting by parents, their evasion of "their direct duties, i.e. prevention of skipping classes by students ..., as well as helping to supervise students' behavior outside the school, and in their apartments". Of course, such facts used to take place, and for the state-run school they may have been the reason to put an end to the activities of parent organizations. However, references to the position of school headmasters, their authority that the parent organizations were undermining by their mere existence, are considered insufficient. The unsystematic way of work could be explained

by the lack of experience of the social force being formed and, along with the poor attendance, the activities of the school administrations themselves that would create obstacles by using vague formulations of the laws that regulated the functioning of parent organizations.

It seems to us, that not only the family, but also the school itself should be concerned about skipping classes by students as well as their behavior in and out of school. With deep regret, one of the contemporaries commented on that mutual sidestepping of the responsibilities, "There used to be times when parents, in a loving manner, reprimanded the student for a bad assessment mark that he, with tears in his eyes, brought home, while telling him, "you were lazy, you were inattentive, you did not try". Now, in such cases we sometimes hear that the teacher is to blame, as he has failed to understand the child's individuality, he does not know how to teach, he gives too much homework. Thus, to a certain extent, the former unity of the family and school has been lost" (Fisher, 1912: 17-18).

While analyzing the results of the consideration of the issue I.V. Zubkov notes that "the impeccable ... idea of parent organizations in schools failed to find support from a significant part of parents; the procedure established by the ME for the formation of parent committees was not the main reason for their insignificant spread" (Dmitriev, 2012: 198-203). But to make this conclusion, clear statistics should be obtained on how many parent committees there were initially and how many of them still operated after the introduction of the new rules, while according to other sources it is after this decree that the number of parent organizations was reduced (N.A., 1915: 2; Fisher, 1912: 13). While responding to attacks by the right press, the author of the article in *The Russian School* magazine argues, "If we are about to conclude that the parent committees are not needed only based on the fact that the meeting was not attended by required 2/3 of the parents, then the same could be said about any public organization, even the State Duma, as in fact, far fewer than two-thirds of voters as often as not took part in the additional elections. But is it possible to conclude after all that the State Duma is also not needed?" (N.A., 1915: 2-3).

With the exception of pre-revolutionary works by Russian authors, almost all the rest of the historiography focused on state-run schools, thus excluding public and privately run ones since there were just a few of them. However, it is the last two kinds of schools, as represented by commercial schools, that had a longer and more effective experience of interaction with the family.

An attempt to fill gaps in the discussion on the role, degree of participation in school life and need for the parent organizations that had been established by the beginning of the XX century is the purpose of this article.

4. Results

Officially, parent organizations in the Russian secondary school were allowed since November 1905 (Sovet Ministrov, 1990: 62-64). The reason for this was stated in the memorial itself, "The extremely difficult position of the secondary educational institutions due to the lack of authority of the pedagogical councils, inability of public institutions to participate in secondary education process and the lack of interaction between parents and the school" (Sovet Ministrov, 1990: 63). According to the decree, every school was allowed to establish school and class councils of parents, who were entitled to elect a parent committee and its chairperson. Considering the school's teacher and economic councils, the elected chairperson received the rights, being equal to those of the curator of the educational institution.

Teacher councils were obliged to discuss, in case of submitting for consideration, the decisions of the general parent council and parent committee. The rather vague wording of the document and unclear regulation, being not typical of the ME, were explained by the "unsettling situation of the time" (N.A., 1915: 3), with the possibility of an expanded interpretation in accordance with the local conditions. However, upon the decline of the secondary school movement, the way the memorial was written allowed to narrow the scope of its application by introducing various regulations in 1907, 1908 and 1911 (Dmitriev, 2012: 199, 202), when L.A. Casso, the Minister of Education, introduced quotas for the validity of parent councils of 2/3 of the number of students' parents living in the city, which resulted in the fact that "parent organizations survived only in rare cases" (N.A., 1915: 2).

In this regard, it is necessary to dwell on the causes of parents' absenteeism after the recession of the revolution, which was used by the ME to increase the quorum for the establishment of parent organizations. Having studied the materials of the periodical press of

various political orientation, G.V. Agraev, the contemporary of the events, concluded that "a complex set of reasons that has made parents feel indifferent to an important cause is the antagonism of the bureaucracy and society, educational administration and parents, students and teachers, discord between fathers and children, parents' insecurity concerning their own strengths, heterogeneity of their political, pedagogical and worldly views, philistinism, leading to inertia, inactivity, negligent attitude to their duties, narrowness of views, leading to demagoguery on two sides, i.e. the one of the administration and the one of the parents, general unpreparedness for the use of their rights and excessive development of criticism, being a result of the recent lack of rights, narrowness of the framework of activities outlined by the ministerial circular" (Agraev, 1908: 72-73). However, the text of the work shows that the author considers the main factor to be the school system's counteraction to parent organizations and the gap between the bureaucracy and society. M.I. Fisher develops the idea of the reasons for absenteeism, arguing about the pace of life acceleration and changing the benchmarks of public and private life, "Parents are now less concerned about the upbringing of their children, as they just have no time" (Fisher, 1912: 5).

Commercial schools, as considered quite liberal, went the other way. Some of such schools initially had started to convene parent meetings as well as establish parent councils. Certain commercial schools held joint meetings of parents, board of trustees and teacher committees (Glagolev, 1904: 207). It was not just the liberalism of the commercial school, but the fact that funds coming from the parents in the form of student fees for teaching were a very significant source of revenue for the school's budget. In addition, as there were no board of trustees councils in privately run commercial schools, it was the parent organizations that could exercise the functions of public control and assistance to the school. The commercial school initially supported the idea of closer interaction with the family. At the First Congress of Headmasters and Members of the Board of Trustees of Commercial Schools in 1901, the subcommission on education spoke up in favor of enhancing such contacts so that parents would be able to know and accept the goals and overall structure of the school as an organization, whereas the school would be able to be aware of life conditions of its students" (Materialy, 1901: 58).

Among other ways to contribute to this process, the subcommission suggested holding routine joint meetings of parents and teaching staff. In this aspect, the issue of the need for a serious family and school unity from the parents' point of view should be brought up. It can be seen quite clearly and precisely as the upbringing paragon by the intellectual history of teaching science of this period. However, it was not regarded as being that obvious as a necessity of the parents' everyday life. Indirect evidence might prove that the parents' willingness to cooperate with the school was also limited by objective conditions as well as their readiness. It's not even the absence or weakness of civil society or lack of the experience of meetings participation. E.I. Stratonov criticized the negative aspects of the Russian school in his book, noting, "At the parent meetings, many of them [the parents – T.M.], though without denying the positive consequences of the unity of the family and school, still openly and loudly repeated, whereas the overwhelming majority of parents immediately agreed, that: a) the parents did not feel competent enough in the important educational sphere, that required commitment, knowledge and expertise, to take responsibility for the measures that might one way or another influence the inner life of the school; b) they were totally unaware of the complicated, though if mere economic, matters of the school and did not have enough time to spare to deal with managing or reorganizing these affairs or even at least assisting them; c) they ... had absolutely no power over their children (especially senior students) ... In their opinion, the teacher council could influence the students in a better way, and the parents "were humbly asking" the council and each of its members for that, thus forgetting that it was the council and the authorities that had invited them and waited for their assistance" (Stratonov, 1910: 7-8).

Even when discussing school lunches, being increasingly popular, especially in commercial schools, students' parents were at first quite inert, though it was them who were supposed to be especially interested in such novelty. Thus, at a meeting on October 12, 1908 in the Vyatskoye Commercial College, the parents expressed a collective opinion that "the administration should be solely in charge of this matter" (Hronika, 1908: 3).

Parent meetings were held in almost all commercial schools of the Kazan Academic District (KAD): in the city of Vyatka (constantly since 1908), the city of Samara (mentioned in 1904), the city of Kazan (private meetings of parents with teaching staff were held in 1913-1914) (Obshchestvo sodeistviya, 1915: 52; Glagolev, 1904: 209; Godovoi otchet, 1915b: 88-90).

The absence of parent committees in commercial schools created a number of significant problems, among which, for example, the board of trustees of the Kazanskoye Commercial College called certain difficulties with organization of contacts with parents, taking into consideration a large number of students. Meanwhile, the teacher committee regarded the necessity for establishment of a parent organization as a way of both legalizing the activity of parents who were already taking part in the life of the school and considering their opinions and advice as given by "people of commonsense knowledge" (Godovoi otchet, 1914: 11, 20).

Due to the existing restrictions, some parents sought to strengthen the status of the parent organization. In the Vyatskoye Commercial College (VCC), this was expressed in an attempt to establish "a parent society to promote commercial education", its charter being also actively developed by the chairpersons of the parent commissions (Otchet Vjatskogo, 1912: 5-7; Obshchestvo sodeistviya, 1915: 52-53). The parents' activity faced only organizational obstacles as represented by ministerial provisions, but was artificially "lowered" by the supervisory authorities. This is how a correspondent of *The Vyatskaya rech'* newspaper described the parent general meeting held in the VCC on September 27, 1910, attended by a police representative, "The headmaster, Mr. Manokhin, read a brief account of the educational aspect of the school's activity. The public listened to the report in silence. No one answered the chairperson's proposal to speak up about the students' upbringing" (Hronika, 1910: 3).

In order to learn more about the students, their living conditions as well as home environment the VCC administration would distribute questionnaires for the students' parents to fill in. To avoid any possible inconveniences, the questionnaires were allowed to be handed over to the chairperson of the parent commission, and yet not all the data was obtained (Otchet Vjatskogo, 1912: 14-15). Questionnaires were the most effective way to receive feedback from parents to be able to solve topical issues. Thus, after a series of publications in the local press about the educational difficulties at the Kazanskoye Commercial College (KCC), the teacher council conducted a questioning of the parents "for more accurate clarification of the parents' requests and the elimination of possible misunderstandings" along with a discussion of its results at the parent meeting (Godovoi otchet, 1914: 21-23). The questionnaires were also distributed for preliminary clarification of topical issues of the school life, such as readiness to establish parent committees, introduction of optional subjects, and so on (Godovoi otchet, 1914: 21-22).

At the Commercial Education section of the III Congress of Russian community on technical and vocational education, there was a fierce dispute on the issue of the school unconditional attendance by parents. The majority spoke in favor of such admission to the classes by parents, but in the end, it was resolved that it was up to the teacher committees to grant the admission or not. It was the opinion of Prof. K.A. Andreev, the headmaster of the Aleksandrovskoye Commercial College and chairperson of the Moscow Teacher Society, that was of great significance. Prof. K.A. Andreev recommended "caution in using the right to attend classes, i.e. caution dictated by the interests of both the teacher and students," explaining that "even a headmaster, a person being really close to the school, would sometimes stop at the class door thinking, whether he might interrupt, sever the thread that connects both the teacher and class" (Glagolev, 1904: 212-213) Certain commercial schools of the KAD introduced parents' unconditional attendance of classes (Obshchestvo sodeistviya, 1915: 53) and schools in general during the work hours, seeing in as "the most effective way (for the parents) to get acquainted with the school's activities" (Otchet o dejatel'nosti, 1909: 10-11). While discussing the issues of direct contacts with parents, the SarCC Teacher Committee put forward a rule for the teaching staff "to firmly and strictly adhere to the principles of law and tact" (Godovoi otchet, 1910: 56).

In order to understand the scope of the activities of the parent committees, we need to dwell on the activities of the Samarskoye Commercial College (SamCC) in the 1911-1912 academic year. It took 10 meetings to discuss nine groups of issues, with the financial ones being reported directly in the seven groups. The total expenditure amount of the committee over the year amounted to 3,432 rubles. Two groups of issues were considered in detail, i.e. students' excursions, requests submitted by the parents of underprivileged students for the school fees payment, as well as a group issues on providing breakfasts for underprivileged students, organization of a charity evening, organization of "the Christmas Tree celebration", the committee treasurer reports, the amount of homework and its correct distribution (Otchet o sostoyanii, 1913: 162-164).

Parents provided a significant help to commercial schools in organizing the students'

collective leisure in school. Thus, in the VCC, during the first year the parents arranged a skating rink, took part in the organization of the Christmas celebration and purchased a grand piano (Otchet o dejatel'nosti, 1909: 11). When organizing a one-month excursion of the SamCC students to Finland in June 1914, the parent committee covered the expenses for 20 % of the students in full and partially for the other 20 % (half the cost or more), thus reimbursing almost one-third of the total cost of the excursion (CGASO, F. 190, Op. 1, D. 43, L. 2). In general, parent organizations' financial assistance to students was quite significant, for this reason, in 1914, the VIII All-Russian Congress of Representatives of Exchange Trade and Agriculture recognized the need for their mutual activity with the Aid Societies (O nuzhdakh, 1915: 386).

There were quite a few women among the chairpersons of parent organizations of commercial schools (Obshchestvo sodeistviya, 1915: 52; Otchet o sostoyanii, 1913: 163). It was the women's initiative to provide breakfasts in schools. The fact that a great number of parents were involved in that cause is confirmed, for example, by a list of 47 mothers of the KCC students who were engaged in breakfast provision in the 1912-1913 academic year (Godovoi otchet, 1914: 134-135). Thanks to the financial support of the parent organizations, underprivileged students were given breakfasts free of charge.

Parent councils often became the initiators of the introduction of additional school subjects, i.e., music, singing and dancing (Hronika, 1910: 3). Naturally, parents tried to have classical languages included in the curriculum of commercial schools, but this was due to the hope that commercial school students would be granted the right to enter the universities, the one being equal to the right the gymnasium students already had.

Parent organizations of commercial schools gradually became an important link in the system of public control over the school. Along with the official control authorities, they were capable of having a significant impact on the school life, even a greater one than any other public organization operating in that sphere. This happened, for example, during the conflict of the board of the trustees and the headmaster at the Balakovskoye Commercial College. The latter was about to be dismissed, but the support of the parent council (Balakovskaja hronika, 1914: 2; Hronika, 1914: 2) helped him retain the post. Similar processes of parent organizations stepping up were also taking place in the United States, but, unlike Russia, their activities were less constrained by interference from outside and were fully controlled by civil society (Krupskaya, 1957: 164).

All the discussion about the uselessness of parent organizations, harm they caused to the school, as well as their poor representation of the parent community were debunked by the authorities as it was them who greatly changed the position of parent committees as one of the results of the school reform started by P.N. Ignatyev during the First World War. As they were used to resorting to half-measures in a critical situation, the authorities considered the fifth part of the parent committees left (after the circular by L.A. Casso) as an effective measure.

Later, the Ministry of Trade and Industry on November 19, 1915 introduced "The rules on the organization and activities of parent meetings parent committees in commercial schools" (Pravila ob organizatsii, 1916: 1-6; CGASO, F. 190, Op. 1, D. 62, L. 4-50b). Parent meetings were allowed to be convened by the headmaster or chairperson of the parent committee. To establish a parent committee, one still had to have this issue discussed and finalized by both the teacher committee and board of the trustees and then approved of the Ministry's Department of Education. More important for the parent organizations was the establishment of a quorum of 1/3 of the number of parents residing in the place where the school was situated (CGASO, F. 190, Op. 1, D. 62, L. 40b). Priority in the interaction organization was given by the ministry to "parent councils in view of the fact that these meetings represented the family element to a greater than parent committees, as well as because direct contact of parents with the school will bring them closer to it" (Pravila ob organizatsii, 1916: 13).

In 1917-1918, in the context of frequent administrative vacuum in the education system and political instability, parent councils further enhanced their role in school life, helping the school administration and teacher councils to solve various issues of school life, including those related to teaching and upbringing (CGASO, F. 190, Op. 1, D. 62, L. 14-140b).

5. Conclusion

5.1. Strengthening ties between the family and school became a new stage of the educational policy of Russia at the beginning of the 20th century. This was due to the growth of the social

movement and, at the same time, the need to reduce the intensity of the secondary school movement during the Russian Revolution of 1905. During this period, the idea to involve parents in solving school issues contributed to appeasing students.

5.2. After this, there was a gradual decline in the activity level of parent organizations, which the authorities took advantage of, as they introduced new restraining regulations and conditions. That policy was due to the lack of mass participation of the parent community in the activities of parent organizations. However, the real reasons were the authorities' willingness to weaken the citizens' participation degree in public life, public control over the educational sphere and, in general, the contradictions of the bureaucratic nature of the education system and the school with the ongoing social and civil activity of the urban middle-class strata. Parents' absenteeism did take place in the history of parent meetings, and it was caused not only by the fact that the rights of the parent committees were limited, but also by the conditions of modernization, which had led to the acceleration of the pace of life and employment growth, resulting in the inertia of the parent committees.

5.3. The commercial school, unlike the state-run school, initially had opted for closer contacts with the family, thus establishing relations with parents in a more effective way. A longer history of such relations turned parent organizations in commercial colleges into an important advisory body, as well as diversified and intensified their activities.

5.4. Students' mothers were among the most active participants, sometimes holding the posts of chairpersons of the parent committees. Perhaps, it was the women who made parent organizations of the commercial school avoid both the politicization of their activities and conflicts with school administrations as parent committees concentrated on the charitable support of the school and underprivileged students. In this aspect, they complemented the activities of the Aid Societies.

5.5. The need for unity of the regime and society during the First World War made the government get back to the reestablishment of the parent organizations, whose role increased since that time.

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