ISSN: 0975-8585

Research Journal of Pharmaceutical, Biological and Chemical Sciences

The Educational Process Organization On the Basis of the Cerebral Hemispheres Individual Profile Functional Asymmetry.

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ABSTRACT

Inter-hemispheric asymmetry (functional brain asymmetry) is the most important property of personality, (this unevenness) is "various on nature and participation of the left and right hemispheres, unequal on importance, implementation of mental functions". It is the main condition of a brain normal functioning. Functional asymmetry of cerebral hemispheres represents complex property of a brain, reflecting distinctions in distribution of mental functions between its right and left hemisphere. Successful training and development of the child is promoted by considering these functional brain asymmetry – full development of a calloused body during school childhood, education and training according to dynamics of a child's brain development. In order that any child could study easily and with interest, creatively developing capabilities and talents, and receiving profound knowledge without damage to health - the technique of training and education system should consider the child's specific development features. First of all, the type of functional brain asymmetry (dextrocerebrality, sinistrocerebrality, reciprocal cerebrality) and respectively, thinking type (logical, figurative). As well as the nervous system type of the child, activity of information perception channels, memory type, temperament, state of health, working capacity, informative processes gender features of a children. All these development features of the child determine nature of its cognitive activity. Neglecting them leads to many pedagogical and social problems such as: difficulties in training, misunderstanding and mechanical learning of a training material, lack of interest in school training.

Keywords: FSES (federal state educational standard), professional standard of the teacher, professional competences, IPL (individual profile of lateration), activity approach, the differentiated approach, neuro-pedagogics, educational process, inter-hemispheric asymmetry, brain.

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ISSN: 0975-8585

INTRODUCTION

Currently in Russia there were serious changes in education caused by promptly changing social environment, informatization of educational process, strengthening of a role of modern science achievements in the educational process organization, requirements to professional competences of the teacher. Success of the happening changes directed to educational system competitiveness level increase being in direct dependence on readiness of the teachers to work in it and qualitatively carry out the labor functions. So, in 2013 the Professional standard of the teacher approved by the order of the Ministry of Labor and Social Protection of the Russian Federation as of October 18, 2013 No. 544n which determines requirements to the level of readiness of the teacher to carry out professional obligations is accepted. The standard has provided refusal of the teacher position as being the only unique source of knowledge, conductor of information, knowledge, thoughts, the controller and the appraiser of the achieved results. Now the teacher should become the organizer of student educational activities.

The standard determines an obligation of the teacher to perform professional activity according to requirements of Federal state educational standards the cornerstone for which is system-and-activity approach. Activity approach to the educational process organization becomes not just a kind wish, but the mandatory requirement to methodical system of each teacher today in communication with reorganization of the teacher student training (often the professional activity which has developed for many years) is one of the most important and complex challenges [15].

Distinctive feature of the modern world is prompt changes in external environment, it causes a fast depletion of knowledge. Therefore, the slogan "Education for Life" has lost the relevance today and the new slogan "Education throughout All Life" has come to its change [7].

Success of the planned educational result achievement also depends on a psycho-physiological condition of the student, in particular on specific features cerebral hemispheres functional activity, on a method of its presentation: to what hemisphere it is addressed - right or left - whether it has verbal or nonverbal character, etc. [15]. In article 48 of the Law "About Education in the Russian Federation", obligations of the teacher are determined to apply reasonable forms, training methods considering features of psycho-physical development trained [7].

Until recently brain asymmetry was considered only in the academic aspect. Functional brain asymmetry is the difficult brain property reflecting distinction in distribution of psychological functions between its right and left hemispheres [1,16]. A long time researches in the field of neurophysiology, psychology and pedagogics were performed separately, but at the end of the last century the achievement of these industries were successfully united in the integrative direction — neuro-pedagogics. In this direction researchers J. Bruyer, R. Kane, G. Kane, S. Makklintik, K. Klimek, L. Erlauer, B. Given, S. Spinger, G. Deych, D. Goldberg, J. Stephens, I. Dzhensens, M. Slavkin, D. Tileston, B. A. Arkhipova, T.V. Akhutina, E.Y. Balashova, I.P. Bryazgunova, P. Dennison, V.D. Yeremeyeva, N.N. Zavadenko, E.V. Kasatikov, Y.A Kleyberg, N. K Korsakova, A.R. Luriya, Y.V. Mikadze, N. M. Pylayeva, A.B. Semenovich, E.G. Simernitskaya, O. N. Usanova, K. Hannaford, E.D Homskaya, T.P. Hrizman, L.S Tsvetkova, Yu.S. Shevchenko, etc. worked [6,8,13].

Neuro-pedagogics uses cognitive neurology knowledge, differential psycho-physiology, neuro-psychological knowledge about the brain organization about the processes of mastering different types of training material, considering compatibility of IPL (individual profile of a lateration) options, students and teachers in educational process [6]. The neuro-pedagogics purpose is to help the teacher with the successful solution of professional tasks.

However the leading foreign and domestic experts in the field of neuro-pedagogics note that in professional activity of the teacher of the general education organizations data on individual profile of functional brain asymmetry of the child are very seldom considered [4].

In the course of the research conducted during the period of 2013 - 2015 among 1025 biology teachers for the students of advanced training who were trained according to programs of additional professional education based on the Public educational institution of additional professional education of "Institute of

education development of the Republic of Tatarstan" were confirmed by conclusions of foreign and domestic specialists in the field of neuro-pedagogics.

Respondents noted that - 100% are familiar with the theory of functional asymmetry of cerebral hemispheres, and with features of the functional organization of the brain only - 12%, students (in classes where teachers work) - 7%. At the same time 100% of respondents note that educational process is a bilateral process, so its result will depend equally both on the teacher, and on the student. The law of neuro-psychological interaction says: "… teachers give better grades to children with similar hemisphere organization and underestimate the students with different brain organization" [10]. For students respondents knowing type of brain asymmetry the additional question has been offered: "Do you use knowledge of the cerebral hemispheres functional asymmetry theory of the student?". The received results, were distributed as follows (fig. 1):

1. Yes, I do (when matching acceptances and methods of the student activities organization at a lesson, when seating students in a class, in case of the organization of educational space in class, in case of registration and preparation of training materials, in case of selecting methodical acceptances) – 50%.
2. Occasionally use – 22%.
3. Do not use – 28%.

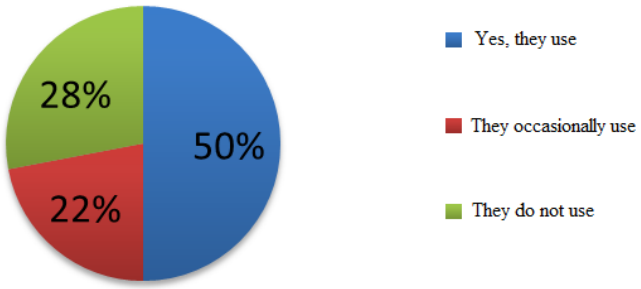

Figure 1. Poll Results

Proceeding from above told, it is possible to draw the following conclusion that only 3,5% of respondents in the professional activity put into practice knowledge of an individual profile of functional brain asymmetry of the student.

Article purpose is drawing attention of teachers to achievements of neuro-pedagogics which will allow the working teachers to increase efficiency of educational process.

RESULTS

When writing article theoretical and empirical methods were applied: studying, analysis of domestic, foreign scientific and methodical literature, standard legal documentation, pedagogical experience, as well as supervision, testing, poll. The techniques of cerebral hemispheres functional asymmetry type definition which are widely applied in psychology and pedagogics have been used [17].

CONCLUSION

For the first time asymmetry in functions of hemispheres was found by the rural doctor Mark Dax in 1836. Later in the XX century in works of Paul Brock, J. Jackson, K. Lipman, K. Vernike, Roger Sperri the new phenomena in the field of the functional inter-hemispheric asymmetry were discovered [11,18,19].

Three mains organization types of a brain were discovered: sinistrocerebral, dextrocerebral and reciprocal cerebral. Representatives of reciprocal cerebral type have no pronounced domination of one of hemispheres, both synchronously participate in a thinking strategy choice.

Masters of the 2nd courses of the pedagogical training branch in the period of 2013-2015 studied practical experience of 125 teachers on the organization of educational process, in particular the methodical

receptions used by teachers and the examination organizations in the course of personal and frontal polls at different lesson stages.

By results of experiment at biology lessons in 7-9 classes teachers used the following receptions:

- 83% of respondents used the acceptances aimed at the development of the left hemisphere such as: "Group", "Exception", "The line of time", "Zigzag", "Cluster", "Intellectual warm-up", "Surprise!", "The support", "Yes-No", "Deaf intelligence – cards", "Create the passport", "The power analysis", "Choose a veracious statement", etc. [2], directed to the detail analysis of objects and processes, accomplishment of logical tasks.
- 16% of respondents used the acceptances directed on the right hemisphere development such as: "A non-standard entrance to a lesson", "Associative array", "Work on concept", "Thinking-up", "I take you with me", "A tree of predictions", "Crossing of subjects", "A round table", etc. [2], directed to forecasting, detection of similarity, comparison of the facts, allocation of essence (main thing), allocation of the key moments, generalization of ideas group.

During questions result analysis teachers at lesson stages used: check of homework, updating of basic knowledge, fixing of new material, lesson results, and received the following results: 81% of teachers questions to students require only mechanical reproduction of training material. Choosing check methods, the teacher shall consider inter-hemispheric brain asymmetry, so for the dextrocerebrals give preference to oral poll, allowing the student to give own developed answer. For the organization of work with sinistrocerebral students the preference needs to be given to written polls, it is desirable to suggest choosing ready answer options.

Leading experts in the field of neuro-pedagogics Sonyer, Francois Bérenger claim that training the left hemisphere, only the left hemisphere is trained, and training the right hemisphere, you train all brain! [5]. N.N. Traugott, T.P. Hrizman, K. Hannaford, Bob Sampls have come to similar conclusions in their works [14]. For this reason in case of the organization of educational process during lesson and after hours the teacher needs to focus in planning process attention on development of creative thinking, to use technologies of training and methodical acceptances directed to the application of theoretical knowledge for real situations.

SUMMARY

Analyzing theoretical sources, recommendations about the organization of working space of a class and educational activity of the trained have been made. At the organization of working space of a class, the teacher needs to remember that at the sinistrocerebral students should sit in the right side of a class. For this hemisphere it is easier for them to concentrate attention and to perceive information. Therefore, the psycho-physiological place the sinistrocerebral children is the first row [9]. The approximate scheme of students seating in a class is submitted in figure 2:

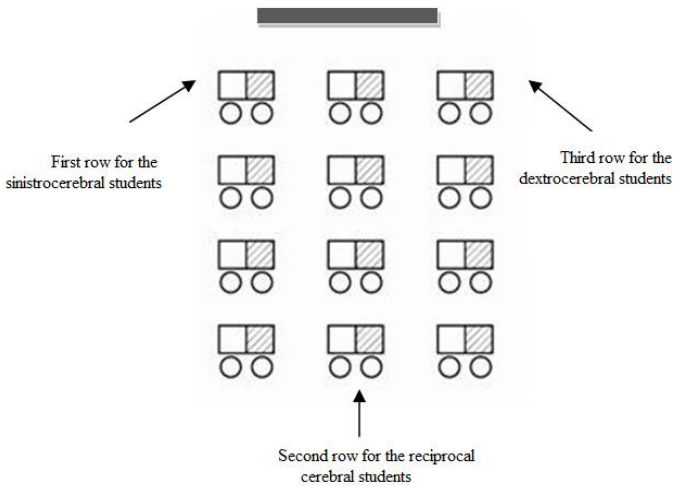

Figure 2. Approximate scheme of seating of students in a class

ISSN: 0975-8585

The arrangement of school desks offered in figure 2 is standard for comprehensive schools. Such arrangement is preferable for the sinistrocerebral children, the dextrocerebral students, in a class it is necessary to put desks in a semicircle. Unfortunately, at this conjuncture it can't be done, therefore, dextrocerebral children initially are in less comfortable conditions in comparison with sinistrocerebral. Answering a question of the questionnaire "What is the cornerstone of students seating in a class?", the answer, the dominating type of the organization of a brain of the student have been chosen only by 2% of respondents. Generally seating of students in a class is carried out on the basis of recommendations of the doctor (69%), student behavior at a lesson (17%), intuitively (personal preference of the teacher) (12%) (fig. 3).

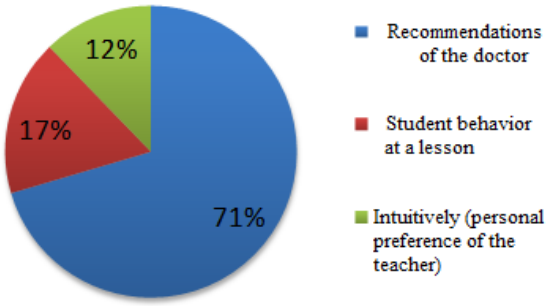

Figure 3. Seating of students in a class

For more complete perception of information from the class board by dextrocerebral students the combination of colors should be the following: light board — dark chalk, for sinistrocerebral - on the contrary: a dark background of a board — a light chalk. The solution of this problem for the teacher is possible as in a class according to FSES requirements the class must have is both – a classical board, and interactive one, where change of a color combination "the background - the text", is a matter of one computer mouse click.
For the differentiated approach to educational activities it is necessary to consider features of perception, conversion of information, intelligence, activities, speech, emotions, memory and thinking (table 1) [9].

Table 1. The organization of educational space on the basis of the differentiated approach

Lesson operational organization stage	Dextrocerebral students	Sinistrocerebral students
Information perception (training material)	Complete intonational aspect of the speech Visual learners (visual) Kinesthetic (tactile)	semantic aspect of the speech discrete (parts) audial (acoustical)
Conversion of information	fast	slow
Intelligence	Nonverbal, intuitive, practical	Verbal, logical, theoretical
Activity	Commitment to practice	Commitment to theory
Memory	Involuntary evident and figurative, visual and muscular (a basis of the innate literacy)	Discretionary sign acoustical
Thinking	Evident-and-figurative operating images spontaneous emotional intuitive three-dimensional (in space)	Abstract-and-logical operating in figures, signs formal rational programmable two-dimensional (on the plane)

The differentiated training always assumes use of the training materials focused both on sinistrocerebral, and on dextrocerebral student type. So at the organization of a lesson the teacher needs to choose educational tasks of the mixed type and to organize work, so that working in group or couple students

having opposite styles of training could interact and help each other. Each of them having a set of individual strategy of training, performing the mixed tasks, will be able to increase and diversify the number of own educational strategy.

CONCLUSION

In the light of stated it is advisable to formulate a number of the practical recommendations allowing to increase educational process efficiency. Thus, when designing a lesson it is important for a teacher to remember that quality of educational process depends on:

- knowledge or abilities of the teacher to conduct diagnostics of functional asymmetry of hemispheres, an individual lateral profile of the student independently, as well as the teacher;
- definitions of the psycho-physiological place of the student in a class behind the school desk;
- ways of representing the training material focused on a specific child with a certain type of cerebral hemispheres functional asymmetry;
- creating lesson conditions allowing to disclose abilities of each student;
- Ability of the teacher to organize inter-hemispheric interaction. That is to organize educational process so that to activate structures of the left and right cerebral hemisphere [12].

In case of the lesson educational space organization the teacher should remember that a brain is not dependent on specialization of hemispheres, it works as a unit. Moreover, development of inter-hemispheric interaction is a basis of intelligence development therefore productivity of training children will depend on matching of the effective methodical acceptances considering type of functional asymmetry of cerebral hemispheres that will allow to make educational process differentiated, more comfortable for each of its participant.

ACKNOWLEDGMENTS

The work is performed according to the Russian Government Program of Competitive Growth of Kazan Federal University.

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