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THE CONTEXT OF RESEARCH IN THE FRAMEWORK OF PHYSICAL EDUCATION REGARDING THE CORRECTION OF PRIMARY CLASS STUDENTS' WRITING

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Abstract: *The article elucidated the theoretical-methodological foundations of the pedagogical benchmarks of influence of the specific means of physical education on the correction of dysgraphia in primary school students, a fact that determined the conceptualization and elaboration of a pedagogical model that allows improving them in the context of school physical education.*
Research purposes of this paper are to analyze of epistemological benchmarks regarding the influence of specific means of physical education on correcting dysgraphia in primary school students. Establishing and analyzing the development of psychomotor characteristics in primary school students and to establish the effect relationships between the specific means of physical education and those characteristics of the writing activity.

Key words: *physical education, graphical disorder, methods and means, psychomotricity, sensorial.*

1. Introduction

The concerns of physical education, in the correction of various learning disorders, are in the center of attention at various stages of the training process: from primary education to high school. In this context, we mention the research carried out by A. R. I. M. Secenov [10], E. Verza [12], N. Bucun [1], V. Rusnac [9], G. Burlea [2], Ungureanu A.[11], Mititiuc I. [6], which addresses the problem of the peculiarities of the psychomotor development of primary school students in the correction of learning disorders, including dysgraphia. These studies reveal that the specific means of physical education contribute to the coordination

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of the activity of the motor centers of the sensory receptors, the formation of motor representations and the harmonization of the process of excitation and inhibition of the nervous system, necessary in the formation of graphic images. The current situation of dysgraphia in primary education in the Republic of Moldova is due to the neglect of the activity of correcting these disorders and the failure to capitalize on physical education in school, which would have benefits in preventing and correcting various learning disorders. Lupuleac V., Goncearuc S. [4], Olărescu V. [7].

The purpose of the research is to develop and implement the Pedagogical Model of the influence of the specific means of physical education on the correction of dysgraphia in primary school students.

Research objectives: Analysis of epistemological benchmarks regarding the influence of specific means of physical education on the correction of dysgraphia in primary school students.

2. Materials and Methods

At the level of theoretical conceptualization: the method of analysis and synthesis, the method of theoretical generalization, theoretical modeling, interpretation and conclusion. Experiment;

At the praxeological level-observation, psychopedagogical experiment; test to determine the level of morphofuncțional, physical and psychomotor development; statistical method for data processing and interpretation

Establishing and analyzing the development of psychomotor characteristics in primary school students. Experimental argumentation of the effectiveness of the Pedagogical Model of the influence of the specific means of physical education on correcting dysgraphia in primary school students.

The pedagogical experiment consisted of two stages: the ascertaining experiment and the formative experiment carried out on two groups of primary school students.

The observation test served as the scientific-methodological foundation of the identification of the predominant forms of dysgraphia in the primary classes; comparative analysis of the psychomotor training of 2nd-grade students with dysgraphia and without dysgraphia for the experimental foundation of the effectiveness of the dysgraphia correction model. The experimental part ended with the testing of all morphofunctional, psychomotor and manual dexterity parameters for the two groups and with statistical-mathematical analyzes of the results obtained.

The specialized literature studies and the research results of the writing process in the primary grades allow us to summarize that dysgraphia is more constant and aggravated in the 2nd and 3rd grades, for the reason that during this period the students are insufficiently developed psychophysically, and the requirements of the alphabetic period of the acquisition of writing are large. The obtained results are presented in Table 1.

3. Results

Table 1

Forms of dysgraphia in primary school students (students / %)

Grade	No.of students	Forms of dysgraphia				Total %
		I specific dysgraphia	II developmental dysgraphia	III motor dysgraphia	IV spatial dysgraphia	
1-st grade	40	3,0	4,0	9,0	7,0	23
2-nd grade	40	4,0	8,0	11,0	7,0	30
3-rd grade	40	3,0	5,0	8,0	6,0	22
4-th grade	40	2,0	2,0	4,0	4,0	12
Total (students /%)	160	12,0	19,0	32,0	24,0	87

The selected methods allowed us to carry out a comparative analysis of the physical age, morphofunctional, psychomotor and motor condition characteristics of students without graphic disorders and students with graphic disorders.

The morphofunctional state of the students in the experimental groups demonstrates that the average indices of waist and body mass are approximately at the same level.

Table 2

Comparative analysis of the test results of two groups of the 2-nd grade, with dysgraphia and without dysgraphia

Crt. No.	Tests	Group of boys without dysgraphia	Group of boys with dysgraphia	t	p
		± m	± m		
I	**Morphofunctional indices**				
1	Height (cm)	124,33 ± 4,11	125,86 ± 4,88	0,07	>0,05
2	Lean body mass (кg)	25,95±1,42	23,51 ± 1,43	0,18	>0,05
3	Frequency of heart contractions (beats /min.)	81,00 ± 2,47	87,40 ± 2,95	1,66	>0,05
4	Stange test (sec)	38,85 ± 1,46	33,19 ± 2,00	2,28	<0,05
5	Genci test (sec)	13,66 ± 0,46	11,91 ± 0,71	2,08	<0,05
II	**Psychomotor indices**				
1	Motor reaction to sound (ms)	0,33 ± 0,01	0,40 ± 0,03	2,31	<0,05
2	Motor reaction to light (ms)	0,32 ± 0,01	0,37 ± 0,02	2,48	<0,05
3	ROM (ms)	10,25 ± 0,31	11,33 ± 0,36	2,30	<0,05
3.1	Number of reactions on time (%)	27	6	Δ -21	
3.2	The number of reactions ahead of time (%)	20	27	Δ +7	
3.3	The number of delayed reactions (%)	53	67	Δ +14	
4	"Tapping" test 40 s. (no. of repetitions)	186,00 ± 6,20	166,50 ± 6,88	2,10	<0,05
4.1	Dropping the number of touches from 1st to the 4th square(%)	31	43	Δ +12	

Crt. No.	Tests	Group of boys without dysgraphia	Group of boys with dysgraphia	t	p
III	**Motricity indices**				
1	MSFT 3x10м (s)	9,60 ± 0,32	10,77 ± 0,44	2,17	<0,05
2	The strength of the dominant hand (%)	56,82	41,00	Δ≈ 16	
3	Jump rope 30 (s), (no. of repetitions)	30,18 ± 1,06	26,83 ±1,23	2,07	<0,05
4	Hanging on the bar (s.)	34,34 ± 1,48	29,32±1,87	2,11	<0,05
5	Rolls back and forth in 10(s)	5,87 ± 0,30	4,98 ± 0,22	2,42	<0,05
6	"Ozeretsky-Guilmain" test (s)	24,56 ± 0,88	21,66 ±1,03	2,15	<0,05

At the same time, students with dysgraphia show a certain increase in the frequency of heart contractions (P<0,05). By this we assume that the decrease in the function of the cardio respiratory system in primary school students can have a negative influence on the development and formation of graphic qualities.

The analysis of the *psychomotor* characteristics of the examined students demonstrates the fact that for students with dysgraphia, the average scores of the applied tests are significantly lower, compared to students without dysgraphia. Thus, the average indices in the test to determine the motor reaction to light, sound and to moving objects in students with dysgraphia are significantly lower, compared to the group of students without dysgraphia (P<0,05).

We conclude that the insufficient development of the psychomotor state of primary school students can be significantly reduced by applying the methodology and special techniques to physical education. However, we deduce that there are gaps, including the lack of specific methods and means for correcting dysgraphia in primary school students; we can highlight the consequences of this gap in the student's success.

In this way, we came to the conclusion that it is necessary to develop an experimental pedagogical model of the influence of the means of specific physical education with the aim of correcting dysgraphia in primary school students, which, through its content and organization, activates positive affectivity in students and at the same time, motivation towards these activities through specific methods oriented towards didactic games with motor content for the general physical, psychomotor and fine musculature development of the hand, contributing to the elimination of dysgraphia.

This model is applied by physical education pedagogues, parallel to the physical education lessons within extracurricular lessons. The number of hours allocated is two per week.

The study period, with a total number of 108 hours per year, includes three levels:

1. Early-level correction of motor dysgraphia oriented towards general physical training.
2. This level aims to improve physical development and motor capacity, as the practice of general physical development exercises influences both the formation of the capacity for independent action and free expression in graphic movement.
3. The basic intermediate level in the correction of motor dysgraphia is

oriented towards the development of psychomotor peculiarities. This level is structured on five coordinates: body scheme, spatial structuring, temporal structuring, laterality, coordination, and reactions to the movement. The development of psychomotor characteristics is essential in the correction of dysgraphia, explained by the fact that it restores an ability to orient on a sheet of paper, to coordinate with the movements involved in the graphic act, to have the reaction of the movements and last but not least, the realization of the personality of the dysgraphic child.

4. The level of improvement and graphic adaptation oriented towards the development of fine muscles.

The formation of fine movements of the fingers and hands contributes to the writing process, to avoiding fatigue and again as an effect, it will increase the speed of the action and the adoption of "silent" writing".

Table 3

The distribution of hours of the experimental model for 2nd-grade students in the extracurricular activity of correcting motor dysgraphia

Crt. No.	The methodical-didactic system	The initial level of dysgraphia correction	Basic intermediate level	The level of refinement and graphic adaptation	Assessment	Total hours
1	General physical training	32	-	-	2	34
2	Specialized psychomotricity training	-	50	-	2	52
3	Development of local motility of the fine muscles	-	-	20	2	22
	Total hours	32	50	20	6	108
	%	29,13%	46,30%	18,52%	5,56%	100%

In order to argue the effectiveness of the Pedagogical Model of the influence of the specific means of physical education on the correction of dysgraphia in primary school students, the pedagogical training experiment was organized and carried out during one year of studies.

Thus, we organized two experimental groups of students (boys): the experimental group and the control group. The evaluation tests confirmed a significant increase for the experimental group and maintenance of the initial level for the control group, with a discrepancy between the two groups, relevant from a statistical point of view. This proves that the implemented independent variable confirms the initial expectations, and can be considered an optimal solution for improving the writing process.

Table 4 shows the results of the psychomotor testing for students with motor dysgraphia, which includes the experimental and control groups.

As can be seen in Table 4, to study the psychomotor state of the students trained in the experiment, special tests were used that reflect the state of the simple motor

reaction to sound and light stimuli, the complex reaction to the moving object and the state of the speed of elementary movements The "Tapping" Test " the results of which complexly reflected the state of fine psychomotor development of the students of the experimental and control groups at the beginning and at the end of the experiment. The results of the comparative study of the statistical characteristics of the students at the beginning of the experiment demonstrate that at the initial indices they are equally homogeneous (P>0.05).

Following the comparative analysis of the final results of the experiment, the differences between them appear obviously significant in the case of the comparison between the initial and final testing in the experimental group, in the test of the motor reaction to sound and light excitation, the general reaction to the moving object, as well as to the state of speed capabilities and the "Tapping" Test. It draws attention to the fact that the components of the complex reaction to the moving object improved considerably in the experimental group: 72% more reactions on time; by 16% less (before time) and by 56% (delayed reactions). The improvement of the indices in the "Tapping" Test by 14% at the end of the experiment characterizing the state of the motor centers of the nervous system, largely by 5%, reflects the decrease in motor fatigue of the students in the experimental group compared to the control group.

Table 4. The data obtained from the psychomotor tests of the students of the experimental group confirm that at the end of the experiment the totalizing data compared to the initial data improved considerably and truthfully (P<0,01-0,001).

Table 4

Comparative analysis of the initial and final indices of the psychomotor development level within the pedagogical experiment (n1=15; n2=15)

Nr crt	Tests	Groups and statistics	Initial indices ± m	Final indices ± m	Statistics	
					t	P
Psychomotor status						
1	Motor response to sound (ms)	E	0,36±0,03	0,24±0,02	4,40	<0,001
		M	0,39±0,03	0,34±0,03	1,67	>0,05
		t	0,75	2,25	—	—
		P	>0,05	<0,05	—	—
2	Motor response to light (ms)	E	0,35±0,03	0,23±0,02	4,80	<0,001
		M	0,36±0,03	0,33±0,03	1,33	>0,05
		t	0,25	2,25	—	—
		P	>0,05	<0,05	—	—
3	ROM (ms)	E	10,18±0,31	9,07±0,27	3,61	<0,01
		M	10,43±0,32	9,91±0,30	1,79	>0,05
		t	0,57	2,10	—	—
		P	>0,05	<0,05	—	—
3.1	Number of reactions on time (%)	E	7	79	Δ + 72	
		M	8	13	Δ + 5	

Nr crt	Tests	Groups and statistics	Initial indices ± m	Final indices ± m	Statistics	
					t	P
3.2	Number of reactions ahead of time	E	28	12	Δ –16	
		M	26	24	Δ –2	
3.3	Number of late reactions (%)	E	65	9	Δ –56	
		M	66	63	Δ –3	
4	"Tapping" test 40 sec. (no. of rep.)	E	170,85±7,18	203,17±6,94	4,84	<0,001
		M	172,30±7,13	181,18±7,00	1,33	>0,05
		t	0,14	2,23	—	—
		P	>0,05	<0,05	—	—
4.1	Dropping the number of touches from 1st to the 4th square	E	42	28	Δ –14	
		M	41	32	Δ –9	

Note: f - 14 P - 0,05; 0,01; 0,001; f - 28 P - 0,05; 0,01; 0,001.
t = 2,145 2,977 4,140 t = 2,048 2,763 3,674
E – experimental group; M – control group.

Realizing a tantalization of the psychomotor training of the students of the experimental group, it should be noted that during the experiment they improved their results in all the applied tests. However, the results of the experimental group in all tests are significantly higher (P<0.001) compared to the control group of students both dynamically and between groups. We can confirm that due to the application of the proposed Model in the experimental group, not only a positive but also significant development was achieved.

At the beginning and end of the pedagogical experiment, control dictation was carried out in the groups subjected to the experiment, which, according to the results, would confirm our hypothesis about the influence of special methods and means of physical education in correcting dysgraphia.

At the end of the experiment, the number of graphic errors committed was highlighted in both experimental groups. In the control group, the final results compared to the initial ones did not change significantly and have a comparatively insignificant character (t=1.15, P>0.05), but in the experimental group of students, their tantalization errors compared to those initials have changed significantly (t=6,07; P<0,01).

4. Conclusions

The generalization of the theoretical studies and the analysis of the psychophysical peculiarities of the students allowed the development of the Pedagogical Model of the influence of specific physical means on the correction of dysgraphia in primary school students, which produced essential changes in the school environment of the student through harmonious general physical development. The dynamic study of the pedagogical experiment allowed us to establish the level of formation of graphic skills according to the age in accessibly written tasks in the education process in primary classes. The orientation of the proposed Model in the correction of dysgraphia in the experimental group

significantly influenced the improvement of their handwriting. While in the control group, students who practiced physical education in a traditional way, such changes did not occur.

References

1. Bucun, N., Guţu V.l., Pogloşa, L.: *Evaluarea curriculumului şcolar-perspectivă şi modernizare (Evaluation of the school curriculum-perspective and modernization.* Chişinău, Univers Pedagogic, 2009, p.5.
2. Burlea, G.: *Tulburările limbajului scris – citit (Disorders of the written-read language)*. Iaşi, Polirom, 2007, 264 p.
3. Grimalschi, T., Boian, I.: *Educaţia fizică. Ghid de implementare a curriculumului modernizat pentru treapta primară şi gimnazială (Physical education. Implementation guide of the modernized curriculum for primary and secondary school).* Chişinău, Liceum, 2011, 95 p.
4. Lupuleac, V., Goncearuc, S.: *Corecţia tulburărilor dislexico-disgrafice la elevii claselor primare în procesul educaţiei fizice (Correction of dyslexia-dysgraphia disorders in primary school students in the process of physical education).* În: Materialele Congresului Ştiinţific Internaţional "Sportul olimplic şi sportul pentru toţi". Ed. XV-a. Chişinău, USEFS. 2011, p. 457-462.
5. Lupuleac, V.: *Studiul nivelului pregătirii psihomotrice al elevilor cu disgrafie din clasa a II-a. În: Revista Ştiinţifico-metodică „Teoria şi arta educaţiei fizice în şcoală" (The study of the level of psychomotor training of students with dysgraphia in the 2nd grade*. In: Scientific-methodical magazine "Theory and art of physical education in school"). Chişinău, USEFS, 2014. Nr. 2, p.36-38.
6. Mititiuc, I., Purle, T.: *Disgrafii consecutive" Incursiune în universul copiilor cu tulburări de limbaj"* (*Consecutive dysgraphia" Incursion into the universe of children with language disorders").* Bucureşti, Pim, 2005, p.178-210.
7. Olărescu, V.: *Corecţia psihomotricităţii şi instabilităţii capacităţii de muncă la copiii cu reţinere în dezvoltarea psihică (Correction of psychomotricity and work capacity instability in children with mental retardation).* Chişinău, Elena -Vl., 2008, 128 p.
8. Raţă, G.: *Educaţia fizică şi metodica predării ei (Physical education and its teaching methodology)*. Iaşi, PIM, 2008, p.87-88.
9. Rusnac, V.: *Scrierea (elemente teoretico-ştiinţifice şi metode de cercetare) (Writing (theoretical-scientific elements and research methods).* Chişinău, s.n. 1999, 56 p.
10. Сеченов, И.М.: *Избранные произведения.Физиология нервной системы (Selectedworks. Physiology of the nervous system).*Москва: АкадемииНаук. 2010. 938 p.
11. Ungureanu, A.: *Predarea lecţiei de educaţie fizică prin jocuri de mişcare (Teaching the physical education lesson through movement games).* Craiova, Universitatea, 2010, p. 120-246.
12. Verza, E.: *Dizgrafia şi terapia ei (Dysgraphia and its therapy).* Bucureşti, Didactică şi Pedagogică, 1983, 243 p.
13. Voiculescu, E.: *Pedagogie şcolară (School pedagogy).* Bucureşti, Aramis, 2005, p. 41-45.