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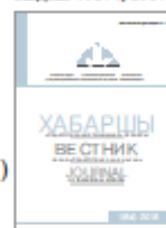


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# ХАБАРШЫ

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**ИНКЛЮЗИВТІ БІЛІМ БЕРУ**

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Раздел 4

**ИНКЛЮЗИВНОЕ ОБРАЗОВАНИЕ**

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Section 4

**INCLUSIVE EDUCATION**

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### **FORMATION OF SPATIAL-GRAPHIC SKILLS IN CHILDREN WITH DELAYED PSYCHICAL DEVELOPMENT**

This article discusses the developed set of methods for the formation of spatial-graphic skills in children of senior preschool age with delayed psychical development. For the experiment, 20 children were taken at the age of 6; 10 of whom had a diagnosis of "mental retardation", and the other 10 children had an age level of intellectual development. The experiment was carried out in two stages: the first stage – ascertaining the study of the state of the problem of the formation of spatial-graphic skills in children of preschool age with mental retardation; the second stage is forming, carrying out experimental work with children of senior preschool age with mental retardation. Experimental verification of the effectiveness of a set of classes with games and exercises that affect the formation of spatial graphic skills in children of senior preschool age with mental retardation. According to the results of the experiment, children of older preschool age with delayed psychical development undergoing special training increased the level of awareness of spatial-graphic skills. In determining their position in space, they operated with a significant amount of verbal spatial terminology. Children learned to differentiate, generalize, and establish spatial relations between objects and objects of the surrounding reality.

**Key words:** delayed psychical development, spatial-graphic skills, correctional and developmental work, attention, teacher-defectologist.

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#### **Формирование пространственно-графических навыков у детей с задержкой психического развития**

В данной статье рассматривается разработанный комплекс методик для формирования пространственно-графических навыков у детей старшего дошкольного возраста с задержкой психического развития. Для эксперимента были взяты 20 детей в возрасте 6 лет, 10 из которых имели диагноз «Задержка психического развития», а другие 10 детей – обладали возрастным уровнем интеллектуального развития. Эксперимент проводился в два этапа: первый этап – констатирующий, изучение состояния проблемы формирования пространственно-графических навыков у детей старшего дошкольного возраста с задержкой психического развития; второй этап – формирующий, проведение экспериментальной работы с детьми старшего дошкольного возраста с задержкой психического развития. Экспериментальная проверка эффективности комплекса занятий с играми и упражнениями, влияющих на формирование пространственно-графических навыков у детей старшего дошкольного возраста с задержкой психического развития. По результатам эксперимента у детей старшего дошкольного возраста с задержкой психического развития, проходивших специальное обучение, повысился уровень осознанности пространственно-графических навыков. При определении положения в пространстве они оперировали значительным количеством вербальной пространственной терминологии. Дети научились дифференцировать, обобщать, устанавливать пространственные отношения между предметами и объектами окружающей действительности.

**Ключевые слова:** задержка психического развития, пространственно-графические навыки, коррекционно-развивающая работа, внимание, педагог-дефектолог.

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**Психикалық дамуы тежелген балалардың кеңістіктік-графикалық дағдыларын қалыптастыру**

Бұл мақалада психикалық дамуының тежелуі бар мектеп жасына дейінгі жастағы балалардың кеңістіктік-графикалық дағдыларын қалыптастыру әдістемесі қарастырылған. Тәжірибелік жұмысқа 6 жас шамасындағы 20 бала алынды, олардың 10 «психикалық дамуы тежелген» диагнозымен тіркелген, қалған 10 бала интеллектуалды даму деңгейі қалыпты балалар. Тәжірибелік зерттеу жұмысы екі кезеңде жүзеге асырылды: бірінші кезең – тұрақтандырушы, психикалық дамуының тежелуі бар мектепке дейінгі жастағы балалардың кеңістіктік-графикалық дағдыларын қалыптастыру мәселесінің жай-күйін зерттеу; екінші кезең – қалыптастырушы, психикалық дамуының тежелуі бар мектепке дейінгі жастағы балалармен тәжірибе жұмыстарын жүргізу. Психикалық дамуының тежелуі бар мектепке дейінгі жастағы балалардың кеңістіктік-графикалық дағдыларын қалыптастыруға әсер ететін ойындар мен жаттығулармен өткізілетін сабақтар жиынтығының тиімділігін тәжірибелік тексеру жүргізілді. Эксперимент нәтижелері бойынша арнайы дайындықтан өткен психикалық дамуының тежелуі бар мектепке дейінгі жастағы балалардың кеңістіктік-графикалық дағдыларының деңгейін артты. Кеңістіктегі жағдайларды анықтағанда олар вербальды кеңістіктік терминологияның айтарлықтай көп мөлшерімен жұмыс істеді. Балалар табиғат объектілері мен объектілер арасындағы кеңістіктік қарым-қатынастарды саралауға, жинақтауға, анықтауға үйренді.

**Түйін сөздер:** психикалық дамуының тежелуі, кеңістіктік-графикалық дағдылар, түзету-дамыту жұмыстары, зейін, педагог-дефектолог.

**Introduction**

Timely systematic psychological, medical and pedagogical assistance to preschool children with impaired development, advisory and methodological support of their parents, social adaptation of the child and the formation of his prerequisites for learning activities carried out in the education system, health and social protection.

Preschoolers with developmental disabilities sent to educational institutions for children in need of psychological, pedagogical and medico-social assistance and other organizations of the education system, health care and social protection in consultation with their parents. The high demands of society for the organization of education and training intensify the search for new, more effective psychological and pedagogical approaches aimed at bringing learning methods into line with the requirements of life. The success of schooling children depends on their decision (Dunaeva Z.M., 2014 [1]; Kapustina G.M., 2008 [2]; Loginova V.I., 2010 [3]).

For a normal process of reading and writing, a high level of development of visual and spatial perception, general and fine motor skills is necessary. In the process of writing and reading, oculomotor associations supplemented by visual and oculomotor elements. A temporary connection formed between the audible, visible, and spoken word. For the mechanism of writing, the interaction

of speech motor, visual and general motor analyzers is also of great importance (Lubovskiy V.I., 2004 [4]; Museyibova T.A., 2010 [5]; Museyibova T.A., 2001 [6]).

As pointed out by A. R. Luria, the normal course of the writing process is impossible without the letter-grapheme and the letter-kinema motor image existing in the child. For the formation of grapheme, normal functioning of visual and spatial perception is necessary, and for the formation of kinema-also a sufficient level of development of motor and visual-motor coordination (Pepik I.A., 2017 [7]; Linskiy B.I., 2012 [8]; Simonova N.V., 2010 [9]; Holmovskaya V.V., 2005 [10]).

The American scientist David Pruitt associates learning problems with impaired functions for receiving, storing and processing information, as well as attention deficit hyperactivity in children. The author notes that difficulties in the learning process experienced by 1 out of 10 children of primary school age. It is possible to talk about difficulties in learning in cases where a child cannot understand a multi-step instruction without an adult's help, has difficulty in mastering the skills of writing, reading and counting due to the lack of visual-spatial functions and arbitrary memory. The child has impaired general motility and coordination of subtle differentiated movements of the fingers; unformed temporal representations. To avoid the snowball effect, according to David Pruitt, special attention should be paid to the issues of prevention



and early correctional and pedagogical assistance to children at risk of learning difficulties, the problem of the interaction of specialists in order to organize effective work to overcome specific school difficulties (David Pruitt, 1998) [11].

Despite the increased interest of researchers in recent years to the problem of preventing violations of writing and reading, today there is no single set of training methods aimed at developing those speech and non-speech skills that are the basis for proper reading and writing. It is very important, therefore, to single out the parameters of readiness for mastering literacy and to create based on this a system of teaching methods, which carried out before the start of school education and which helps prevent potential difficulties in mastering these processes (Shemyakin F.N., 2008 [12]; Birch H.G., Lefford A., 2004 [13]). The need to address this issue in the theoretical and practical plans and at the same time its inadequate development has now determined the relevance of the topic of this study.

Purpose of the study: to develop a set of techniques for the formation of spatial-graphic skills in children of senior preschool age with delayed psychical development (DPD).

Materials and Methods. For the experiment, 20 children taken at the age of 6 years, 10 of whom had a diagnosis of "delayed psychical development", and the other 10 children had an age level of intellectual development.

The experiment conducted under normal conditions and because of taking into account the leading type of activity – the game. Children offered tasks in the form of a game, incentives and rewards used, which made it possible to intensify the productive activities of children of preschool age.

The experiment conducted in two stages:

Stage 1 – ascertaining, the definition of the research concept. The study of the state of the problem of the formation of spatial – graphic skills in children of senior preschool age with DPD. Development of a set of classes with games and exercises that affect the formation of spatial – graphic skills in children of senior preschool age with DPD.

Stage 2 – forming, conducting experimental work with children of senior preschool age with DPD. Experimental verification of the effectiveness of a set of classes with games and exercises that affect the formation of spatial graphic skills in children of senior preschool age with DPD.

We have developed five diagnostic complexes, easy to use, requiring little time and easy to interpret, sets of tasks: the complex – tasks to identify the

state of small and large motility; the complex – tasks to identify the state of visual perception; the complex – tasks to identify the state of spatial representations; the complex – tasks for identifying the state of sensory standards; the complex – tasks for identifying coordination in the eye-hand system.

Because of the experiment, three variants of children's answers identified in terms of the quality, accuracy and independence of the assignment:

– the first option of answers – "high" level – assumed the children to perform tasks quickly, independently and accurately. The children met the proposed tasks with interest, fully accepted and understood the tasks. The results of the work corresponded to a given sample; the result adequately evaluated in comparison with the sample, and this done in an expanded speech form and completely independently.

– the second variant of answers – "medium" level – was distinguished by a good level of implementation of training activities, but the task performance was not distinguished by sufficient accuracy, diligence, perseverance in obtaining high quality. Tasks mainly performed accurately, if individual errors made, then when drawing attention to them and providing permissible assistance (detailed explanation of the instruction, showing the sample), errors noticed and corrected by themselves. The pace of action is usually average. The result of the work, in general, corresponds to the sample, or some inaccuracies are noted.

– the third variant of answers – "low" level – was characterized by a slow pace of task performance, random samples and errors without analyzing the result, distractibility, incorrect task performance, even with the use of permissible assistance from the experimenter. The result of the work does not match the model, or is wrong.

Results and Discussion. The method of system analysis used by us made it possible to reveal the fact that in the process of child development. The loss or weakening of any one of the mental conditions involved in the formation of spatial-graphic skills leads (to some degree or another) to a lack of general readiness for school education, and not just to the lag of any of its parties.

We established a logical connection between various speech and non-speech processes: impaired sensory perception and deviations in motor coordination, between active and passive speech; revealed a regular systemic interaction and interdependence of speech and non-speech processes in the development of oral and written forms of children's speech.

The results of the generalization of the experimental data indicate that 29% of children of senior preschool age with DPD have an average and low level of formation of spatial – graphic skills. Knowledge in this category of children is incomplete and imperfect. They experience the greatest difficulties in performing tasks that require spatial orientation and sufficiently developed movements of the hand and fingers. The ideas of children of senior preschool age with DPD about their surroundings are extremely limited. Some children of preschool age with DPD (35%) have difficulty in possession of spatial verbal – conceptual designations.

Practically in all tasks that require the operation of spatial concepts, specific features observed: children have a poor understanding of the concepts of “left” – “right”, do not use the pretext “above”, rarely use comparative adverbs “to the left” – “to the

right”. The study showed pronounced kinesthetic and dynamic disorders of fine motor skills in 8% of children of senior preschool age and minor kinetic and dynamic disorders in 31% of children in this category. Only 61% of children of senior preschool age with DPD experienced differentiated and precisely coordinated movements of the hand and fingers. Comparison of the results of the study of knowledge of sensory standards and visual perception in children of senior preschool age with DPD revealed a different level of their formation: spatial representations were the least developed in this category of children.

As the results of the ascertaining experiment showed, only 68% of children of senior preschool age with DPD experienced a high level of development of spatial orientations and graphic skills (Figure 1).

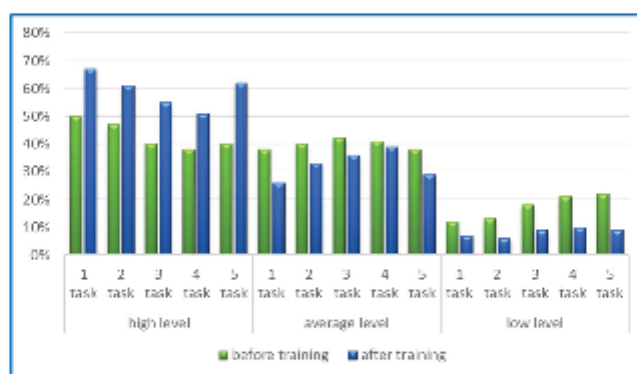


Figure – 1. The levels of development of spatial representations in children with delayed psychical development, in % (before and after learning)

Studying the reasons for such a situation shows that in the traditional formulation of correctional and developmental work, not enough attention paid to developing spatial and graphic skills and incorporating them into the practice of children’s daily activities.

An analysis of the available literature on this issue, the data of the ascertaining experiment and the state of the correctional – developmental process in the preschool education system showed that spatial orientation training based mainly on verbal methods that do not allow the formation of full-fledged spatial graphic skills. The haste of introducing spatial terminology in the early stages, when the child has

not yet realized his practical experience, leads to the fact that words are assimilated formally and do not become a means of carrying out activities.

Theoretical analysis of the problem and the results of experimental work suggested that the overcoming of these difficulties is possible if in the correctional and developmental process special work carry out on the organization of spatial orientations and the development of graphic skills (Connors C.K., 2007) [14].

The significant differences in the level of formation of spatial-graphic skills that we identified in the process of experimental study suggest a differentiated approach to their training. This

approach will ensure the strength of the material assimilation; will help in the implementation of the principles of science, accessibility, systematic, individual approach in the framework of remedial developmental education.

In accordance with this, the following tasks were determined at the second stage of the research:

1. Develop a phased system for the formation of spatial – graphic skills in children of senior preschool age with preterm pupils in the preparatory group.

2. To form the necessary level of spatial – graphic skills in children of senior preschool age with DPD.

To solve the tasks we have developed a set of methods for the formation of spatial – graphic skills for children of senior preschool age with DPD.

The complex impact in the process of correctional and developmental education on the proposed system of education will contribute to the optimal formation of spatial and graphic skills in children of senior preschool age with DPD, we have used in the formative process various child activities (speech, play, practice, symbolic).

The proposed system for the formation of spatial – graphic skills, built based on the above requirements, is a targeted, specialized, complex effect on the personality of the child during the preparatory (pre-primer) and letter-learning periods of literacy and includes two stages: propaedeutic and main.

The task of the preparatory stage is to clarify the already existing, most developmentally early spatial orientations and motor functions of the hand and their further development.

At this stage, a wide spatial orientation is given, a method for analyzing spatial objects is being formed, hand motor skills are being developed through a set of graphic and practical tasks, spatial orientation is being formed in parallel, and fine hand motor skills are being developed. The tasks of this stage were offered to first-grade students in the pre-primer (preparatory) period of literacy training in the first two weeks of September in the course (in the form of physical exercises, organizational time) and after-hours (outdoor games, etc.).

The task of the main stage is the integration of spatial and graphic skills of children. This stage provides a system of lessons – tasks, in the process of which the ability of children to graphically reproduce, various spatial directions is formed. The implementation of this task was carried out in the first three weeks of the letter period.

Along with the widespread methods of forming spatial-graphic skills that are widely used in correcting and preventing specific errors in writing

and reading, we have included a number of tasks for the development of gnostic-practical functions in the developmental training program. For which existing methods of development of spatial – graphic skills (visual and speech tests of Head, test of Benton, graphic dictations of D. B. Elkonin and tests of N. I. Ozeretsky; diagnostic complexes L. Wenger, S.D. Zabramnoy, I.Y. Levchenko) (Shipitsyva J.M., 2012 [15]; Simonova I.A., 2008 [16]).

In the propaedeutic period, the initial work on the development of spatial orientations was the children's awareness of the scheme of their own body, the definition of directions in space, the orientation in the surrounding "small" space. Next, the children trained in determining the sequence of objects or their images (for example, a series of object pictures depicting fruits, animals, etc.), as well as graphic skills.

To create prerequisites for the subsequent education of positional analysis of sounds in the composition of words with tasks of this type suggested isolating one of the links in the chain of homogeneous objects, images, graphic skills.

Conducting a formative experiment allowed us to establish a change in the level of spatial – graphic skills in children of the control and experimental groups. To assess the effectiveness of the training we carried out, in addition to observations in the process of training sessions, special studies were done out using the methods of the ascertaining experiment, which revealed the state of spatial and graphic skills.

The results of the organization of this training system compared with the results of the control group consisting of 10 children of the same age, who trained according to the traditional method. Comparison of the obtained results showed the effectiveness of the system of formation of spatial – graphic skills proposed by us.

As can be seen from figure 1, because of control studies, it turned out that the majority of children in the experimental group (88%) had significant positive changes in mastering their spatial and graphic skills. Therefore, if in the ascertaining experiment children (39%) had medium and low levels of knowledge, then in the formative one a significant part of the children rose to a high (70%) and medium (28%) level. The number of children with a high level of assignment has increased. The data obtained because of the control experiment may indicate that the children of the experimental group, after conducting a series of training sessions with them, began to operate more freely with spatial concepts and acquired good graphic skills.



In the children of the control group, when re-examining one indicator (the notion of rows, orientation in the scheme of their own body), there were some positive changes, for others there was no positive dynamics (positioning of the object relative to itself). As a result of specially organized training,

children of the experimental group learned quickly and accurately to orient themselves in the scheme of their own bodies, to determine the position of an object relative to another object and relative to themselves, while adequately using the words “between”, “for”, “after”, “from left to right” and others (table 1).

**Table 1** – The levels of development of fine motor skills in children with delayed psychical development, in % (before and after training)

Task execution levels	Order number of tasks									
	1		2		3		4		5	
	before	after	before	after	before	after	before	after	before	after
high level	69	78	63	72	65	78	58	64	58	67
average level	29	22	35	28	27	21	37	34	40	32
low level	2	-	2	-	3	1	5	2	2	1

The control experiment showed that because of the training, the overwhelming majority of children of senior preschool age with DPD experimental relapse to the experimental group (88%) learned the terminology associated with the definition and designation of the object and object in space, and could use it actively if necessary.

To identify the reliability of the results of the study, the data obtained from the control experiment to identify the state of spatial representations subjected to variation statistical processing.

In the control group studying the traditional system of forming these skills, there were no significant changes in the level of formation of spatial representations. The average value of the points characterizing the degree of development of these skills in ascertaining and control experiments turned out to be smooth and therefore with high confidence (at least 95%). It argued that the traditional formation system for children of seven years of age to orient themselves in the surrounding space does not contribute to their development.

Because of special training, children have a good kinetic and dynamic organization of movements, sufficient dexterity, and coordination and differentiated movements of the fingers.

In addition, the children of the experimental group significantly expanded the range of motifs, enriched their content, there was a tendency towards sustainability. The children became assiduous. Revealed a tendency to increase social motives, such as motives of responsibility and self-improvement. Personal motives – initiative and independence –

were developed. The importance of educational and cognitive motives has increased – interest in the content of knowledge.

The children of older preschool age with special educational needs, who underwent special education, increased the level of awareness of spatial graphic skills. In determining their position in space, they operated with a significant amount of verbal spatial terminology. Children learned to differentiate, generalize, and establish spatial relations between objects and objects of the surrounding reality.

#### Conclusion:

An important condition for the full mastery of learning skills, including writing, is sufficient development of the motor and sensory components of the motor analyzer and readiness of the hand as a direct tool for graphic activity to perform precise and complex movements.

Thus, in the senior preschool age, not only is it possible, but it is necessary to develop coordination of the child, spatial representations and “manual skill” in the child to prepare him for mastering the graphic writing. And since the development of these qualities is the task of physical culture, then specially selected physical exercises will help improve the coordination of the child and teach you to navigate in space, develop your hand, and give him everything necessary for successful mastery of the letter.

The basic principles underlying the development of a system of work on the formation of spatial

graphic skills in children of senior preschool age with delayed psychical development is a systematic approach, a comprehensive approach, and an individual and differentiated approach to learning.

The materials of qualitative and statistical analysis of experimental data suggest that the proposed system of work on the formation of preschool children with delayed psychical development of spatial representations. Consisting of two stages – propaedeutic and basic, it creates favorable conditions for the formation of full-scale versatile spatial orientations for the development of understanding and use of spatial verbal-conceptual terms and ensures the preparation of children for mastering the initial writing and reading skills.

As a result of special training, children have a good kinetic and dynamic organization of movements, sufficient dexterity, and coordination

and differentiated movements of the fingers. In addition, children have significantly expanded the range of motives, enriched their content, there has been a tendency towards sustainability. Revealed a tendency to increase social motives, responsibility and self-improvement. Personal motives – initiative, independence – were developed. The importance of educational and cognitive motives has increased – interest in the content of knowledge.

The children of older preschool age with delayed psychical development, who underwent special training, increased the level of awareness of their spatial-graphic skills. In determining their position in space, they operated with a significant amount of verbal spatial terminology. Children learned to differentiate, generalize, and establish spatial relations between objects and objects of the surrounding reality.

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