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Development of psychomotor skills of preschool children

This article deals with the development of psychomotor abilities of preschoolers, aspects of psychomotor phenomena, pentabase. Theories of leading scientists studying psychomotor activity and ability of a person are considered. On the basis of research teachers-psychologists have proofs and examples that the development of psychomotor skills of preschoolers can be purposefully improved and developed with the help of different games and exercises.

Keywords: psychomotor abilities, predisposition, psychomotor properties, self-control, exercise, reading speed, sensorimotor

Rozwój umiejętności psychomotorycznych dzieci w wieku przedszkolnym

Artykuł dotyczy rozwoju zdolności psychomotorycznych dzieci w wieku przedszkolnym i ich różnorodnych aspektów. Rozważane są teorie czołowych naukowców badających aktywność psychomotoryczną. Na podstawie przeprowadzonych na potrzeby niniejszego tekstu badań nauczyciele-psycholodzy dowodzą, że rozwój umiejętności psychomotorycznych dzieci w wieku przedszkolnym można celowo rozwijać i usprawniać za pomocą różnych gier i ćwiczeń.

Słowa kluczowe: zdolności psychomotoryczne, predyspozycje, właściwości psychomotoryczne, samokontrola, ćwiczenia, szybkość czytania, sensomotoryka

Introduction

The article deals with the development of psychomotor skills in preschool children. Theories of leading scientists studying psychomotor activity and human abilities are considered. Based on the research conducted among educators and psychologists, it has been shown that the development of psychomotor skills in pre-school children can be purposefully improved and developed through various games and exercises. The development of psychomotor abilities of preschool children is one of the most important in modern pedagogical psychology. Among these topical, important and at the same time complex issues, its solution requires understanding the accumulated theoretical data, formulating scientific approaches to the definition of the phenomenon of „psychomotor abilities” and empirical verification. Insufficient level of psychomotor abilities of children, in particular gross and fine motor skills, mobility, patience, mastery of elementary movements and their control and management, lead to various difficulties in the educational process at school. In this regard, it is necessary to correctly construct the pedagogical process in such a way that it positively influences the development of the psychomotor abilities of children as an integrative component of the entire ontogenetic cycle of preschoolers.

The term “psychomotor” appeared in psychology thanks to Ivan M. Sechenov, who in his book *Cerebral Reflexes* (1863) revealed the connection of various mental phenomena with the movement and action of a person.

Today, psychomotor phenomena are analyzed in 3 aspects: the motor field (the field of force), the sensory field (the field from which a person receives information for movement), as well as the mechanisms for processing sensory information and organizing motor acts. As a result, psychomotor skills are understood as a set of sensory organs and physical means of effective human activity.

The need for movement is an innate need of humans and animals, which is very important for their successful life.

The problem of psychomotor organization and psychomotor abilities of a person is also fundamental to the science of psychology. In the scientific literature, psychomotor activity and human abilities are considered by many leading scientists. The study of this phenomenon begins with the works of the classics of psychology – Ivan M. Sechenov (1953), Nikolai A. Bernstein (1961), Pyotr F. Lesgaft (1952), Michael Teplovoy (1985) and more. Sechenov noted the importance of the scientific development and development of psychomotor abilities, which form the unity of the mental and physical spheres of a person (Sechenov,

1953, p. 336). After Sechenov, Bernstein made a great contribution to the study of psychomotor (1947, p. 101–160). Their concept of the physiology of action became the basis for a deeper understanding of human conscious behavior, the mechanisms of the formation of motor skills, and the levels of motor structure. Extensive experience in studying the psychomotor abilities of children and methods of their development is presented in the works of Polish authors Joanna Kruk-Lasocka (2013), Jacek Krajewski (2013), Ludmiła Sadovskaya (2008), K. Gurskaya (2008) and others. Vladimir D. Shadrikov (1997) proved that the performance indicators of cognitive and psychomotor processes characterize abilities – both cognitive and psychomotor. Based on the concept of Shadrikov, Bezborodova (2010, p. 22) defined psychomotor abilities as properties of functional systems that ensure the productivity of movements and affect the success of psychomotor activity and specific motor tasks. Nikandrov (2004, p. 14) believes that psychomotor development is „the objectification of all forms of mental reflection through muscle movements”.

According to the Polish author, Professor Kruk-Lasocka (2008, p. 15),

Psychomotorics means the interpenetration of the mental and the motor. Movement, in its broadest sense, becomes the key to interpreting a child's various behaviors. Movement is seen here not only as measurable motor acts, preceded by motor planning and related to motor coordination, manipulation and apraxia, but also as whole body language, which includes the non-verbal code of transmitting information that the child is often unable to convey otherwise. These are looks, facial expressions, gestures, body posture. When dealing with a child with special educational challenges, it is “wounded body language” or a body language that doesn't quite know where it begins or ends.

Research methods

Ozerov made a great contribution to the study of human psychomotor abilities. He experimentally proved that psychomotor abilities are the core of motor abilities, which are based on the cognitive-motor component of a person's psychophysical activity, including sensorimotor, perceptual, intellectual and neurodynamic capabilities, providing effective control of independent motor and motor activity. Most of the work on the study of psychomotor is focused on the study of the mechanism of self-regulation as the most important component of psychomotor abilities. Mental self-regulation is a mental self-influence for the purposeful regulation of the psychomotor activity of the body. The tasks of self-regulation of motor (psychomotor) activity are closely related to the tasks of subjective con-

trol and self-management of motor and sports activities, which are the subject of significant research in pedagogical and psychological literature (2009, p. 248). One of the most productive steps in solving the problem of psychomotor abilities is the concept of Shadrikov. He considered in a new way the theoretical foundations of the psychology of abilities from the standpoint of the qualitative features of functional systems; a definition is given; a structure has been developed and a general mechanism for the development of abilities has been shown. In the concept of Shadrikov, "Abilities are properties of functional systems that have their own dimension of severity and are reflected in the qualitative characteristics of the performance of an action". Pyotr K. Anokhin introduced the concept of „functional system” and successfully used it in the study of the fundamental patterns of behavior. According to Shadrikov, "Functional systems are organizations of mental processes in the brain, characterized by a certain degree of productivity, quality and reliability, which are indicators of the individual severity of functions". Analyzing the properties of psychomotor abilities, Shadrikov (1997, p. 220) showed that the indicators used by different authors are too heterogeneous.

Psychomotorics includes muscle activity, features and properties of simple and complex movements, types of reactions and some functions of the musculo-skeletal system. It should be noted that the properties of psychomotor skills developed by different authors overlap in many respects.

Analyzing and systematically summarizing the opinions of scientists on the structure of psychomotor abilities in their studies, the author Tatiana V. Naumova (2020, p. 23) created a five-component structure of psychomotor abilities based on psychomotor properties that change on the basis of psychomotor self-regulation (Table 1).

Table 1.

Five-component structure (pentabase) of psychomotor. Components of psychomotor abilities

Adaptability		The success of psychomotor activity
	Psychomotor properties (components of psychomotor abilities) that change on the basis of self-control and psychomotor self-regulation	
The effect of exercise		Reading speed

The structure includes abilities, the success of psychomotor activity, the effect of physical exercises, the speed of learning. The selected components of psychomotor abilities are integral elements of the training system. Psychomotor properties (components of psychomotor abilities) are associated with each of the components chosen as the central element of this system and the result of psychomotor activity. They change as a result of the formation of self-control skills and psychomotor self-regulation and are reflected in the success of the activity due to the speed of learning and the impact of physical exercises. The formation of skills of self-control and psychomotor self-regulation reflects the factor of activation of the student's individual potential.

The first component of a systematic description of the structure of psychomotor abilities are abilities. Table 2 shows a five-component predisposition structure (Naumova, 2020, p. 24).

Table 2.

Five-component structure of psychomotor tendencies

Genetics (biological basis)		Continuous step character
	Predispositions	
Procedural nature of development		Conditioning of society (environmental influence)

Predispositions are due to genetic, biological nature.

Many scientists interpret predisposition as congenital anatomical and physiological features that underlie the development of abilities.

According to Siergiej L. Rubinshtein, inclinations are prerequisites for the formation of abilities and are inherent in an individual in the form of a complex of mental processes formed and hardened by a new "natural ability", which refers to the development and improvement of age sensitivity and dependence on the corresponding conditions of activity. Boris M. Teplov considered inclinations as the basis of innate abilities that underlie their development. Leyts understood the original, natural basis of the ability, which was not yet developed, but felt itself in the early stages of activity. From the point of view of Volf S. Merlin (1996, p. 448), inclinations act as separate natural prerequisites for the successful formation of abilities.

Almost all scientists note that predisposition as a natural basis of abilities is determined by a very complex, including social, criterion for the success of an activity. Thus, we should talk about the prerequisite for the development of the

inclinations of society, that is, about the influence of the environment, in particular, on training and education.

It is important to note that the inclinations, built on a biological basis as hereditary conditional inclinations, have a continuously stepwise, changing and transforming procedural nature of development conditioned by society.

Summarizing the views of scientists on the problem of adaptation and highlighting their components, we can conclude that predisposition is a multi-level, organic, hereditarily stable prerequisites for continuous, stepwise, process development, due to genetics and society.

The second component of a systematic description of the structure of psychomotor abilities is the success of psychomotor activity, presented in Table 3 (Naumova, 2020, p. 25).

Table 3.

Five-component structure of the success of psychomotor activity

Psychomotor qualities (coordination, strength, speed, endurance, flexibility)		Turning energy into results
	The success of psychomotor activity	
Organization of the rhythm of movement		Implementation of the motor program

The first parameter of the success of psychomotor activity based on the proposed structure is psychomotor qualities. The success of psychomotor activity is manifested in such human qualities as coordination abilities, strength, speed, endurance, flexibility. Bernstein (1961, p. 105) considered these qualities to be psychophysical, calling them not homogeneous, but sisterly. He described strength as an integral physical quality of the body, dependent on muscular potential. Speed, in his opinion, was a complex trait, including physiology and psychology. He described tolerance as a complex, multi-layered property based on the cooperation of all human systems and organs. He defined coordination of movements as overcoming unnecessary levels of freedom of a moving organ, turning the latter into a controlled system and its highest form – dexterity, which is an integral quality property.

Ozerov (2009, p. 248) identified five significant relationships with other psychomotor indicators (rate and strength of movements, accuracy of motor memory in space and time, a special level of sensitivity in terms of dynamic variables). Yuri V. Verkhoshansky (1988, p. 331) defined coordination abilities as the ability

to regulate external and internal forces that arise when solving a motor problem in order to successfully achieve the desired effect of work with the full use of motor potential.

The second parameter that is of great importance for successful psychomotor activity is the transformation of energy into results. The basis of such activity, according to Valentina N. Shebeko (2010, p. 288), is the genetically determined properties and mental prerequisites of the organism. Genetic properties include a high energy level of nervous processes, increased bioelectrical activity of the brain, high sensory sensitivity, increased speed of perception of sensory information and its fast processing, well-developed motor memory, high concentration of attention.

The third parameter that influences the success of psychomotor activity is related to the maximum performance of the motor program (achieved result) in extreme conditions of training and competition (at the right time). In sports practice, it has been established that various factors affecting the success of psychomotor activity can influence the change in state. Competitive activity for an athlete can be perceived as a stressful situation, as a result of which errors in behavior occur. The preliminary or starting state is accompanied by the strengthening and mobilization of all body functions. A characteristic feature of the previous states is the degree of emotional arousal, which can increase or decrease the result. Between preliminary apathy and preliminary fever there is a state of alertness. A prerequisite for the state of combat readiness is the peak of sports form, as well as awareness of the importance of the upcoming race or start, awareness of responsibility and the desire to win, and demonstration of the result.

The fourth and very important parameter of the success of psychomotor activity is the organization of the rhythm of movement. Vladimir M. Dyachkov notes that the final stage in the formation of motor skills is the formation of a clear rhythm and tempo of movements, a certain spatio-temporal subordination of the structural elements of a holistic movement. Based on this, success in certain sports is associated with the ability to properly distribute actions performed in time (Naumova, 2020, p. 28).

Along with the basic psychophysical properties, the importance of rhythm and accuracy is emphasized in the works of Bernstein, Gurevich, Golovei and others. Thus, E. Jacques Dalcroze, the founder of the Institute of Rhythm, noted that the rhythm of music is closely related to motor skills, to human muscle reactivity. Aleksandrova emphasized the special importance of rhythm for human life. In his opinion, the lack of rhythm is considered a defect that affects all human activity. With the development of a sense of rhythm, motor tasks are solved by saving forces, intellectual activity is performed, the student experiences aesthetic sensations, which consist in special satisfaction from the fact of the success

of motor activity. Olga K. Sechkina notes that the basis for the gradual formation of a sense of rhythm is laid in the early stages of ontogenesis and is closely related to the development of motor and sensory functions. The development of rhythmic abilities ensures the perception of a single space of time, the formation of a holistic picture of the world, the harmonization of mental development. Thus, the success of psychomotor activity is manifested in the basic psychomotor properties of a person and, as a result, depends on a change in a person's energy. The implementation of the human motor program is closely related to the success of psychomotor activity. The organization of the rhythm of movement on the basis of various analyzer systems of the body contributes to the success of psychomotor activity (Alexandrova, 1968, p. 312).

The third component of a systematic description of the structure of psychomotor abilities is the speed of learning, which is closely related to the methodology for organizing training sessions. The analysis of this component is given in the works of many scientists who study the psychomotor activity and abilities of a person. Table 4 presents a five-component structure of reading speed (Nau-mova, 2020, p. 29).

Table 4.

Five-component structure of reading speed

Change over time (how quickly learns)		Uneven change in reading speed
	Reading speed	
Motivational component		Stages of the educational process

The first learning rate parameter is the training time circle. As for the learning rate, the dynamics of changes within one, two, three and other exercises is monitored. For one person, restructuring occurs very quickly (occurs suddenly), and for another, over time. In this regard, in a number of locomotives during the formation of motor skills, we distinguish a pattern designated by Bernstein as a „universal law”, in which, according to his expression in time, „skills immediately become understood”.

A sudden jump or fracture, described by Bernstein (1961, p. 107), during the formation of a certain group of skills means the development of a background correction that ensures the success of the movement. The formation of the necessary quality correction at the leading level is associated with the automation of skills and other qualitative correction that provides motion control at a different qualitative level. Therefore, automation is always a leap in quality associated with the development of different sensitivities. A fully mastered skill implies an opti-

mal degree of automation of motor skills when mastering the exercise.

The second parameter in reading speed is the ratio of the dynamics of reading speed, which is uneven, depending on the internal potential of a person (slow, fast). The essence of such training lies in the orientation of the educational process to potential opportunities and their implementation. The formation of skills in various types of motor actions begins with acquaintance with a certain movement and ends (conditionally) when the movement is easy, confident, with less effort. In this regard, the uneven change in the rate of learning is confirmed by the law of change in the rate of skill development.

Kholodov and Kuznetsov (2003, p. 450) formulated patterns of motor skills formation, which show that a skill is formed not only gradually, but also unevenly, which manifests itself at different levels of qualitative growth at certain moments of its formation. In turn, the unevenness of the learning rate has two types: in the first case, the action is mastered relatively quickly, and then the qualitative growth of the skill slows down. Such uniformity is typical for the study of relatively easy actions, when the child quickly comprehends the basics of motor activity and masters its details for a long time; in the second case, the qualitative growth of the skill at the beginning of training is insignificant, and then sharply increases. Such monotony is typical for the study of relatively complex actions, when externally invisible qualitative accumulations manifest themselves in the form of an increase in the level of motor skills over time.

The third parameter of the learning rate characterizes the stages of the educational process (learning, consolidation, improvement). The training of any motor action is usually divided into three stages: the formation of a preliminary idea of a motor action, the study of a motor action, the consolidation of the skill and the improvement of the technique of movement, the ability to apply the acquired skills in various situations. In teaching motor actions, such didactic principles as consciousness, activity, visibility, accessibility, individualization, consistency, progressiveness are also important.

The fourth parameter of the learning rate as a motivational factor is the motivational component of the activity (awards, congratulations, grades, points, marks, certificates, decals, etc.). In the generally accepted sense, motivation is understood as a set of internal and external driving forces that encourage a person to act, establish boundaries and forms of activity and direct this activity to achieve certain goals.

Thus, the structure of the learning rate of psychomotor activity consists of such parameters as learning stages, learning time, learning rate unevenness, and a motivational component.

The fourth component of the structure of psychomotor abilities reveals the significance of the training effect, which consists in the ratio of mental stability,

confidence, endurance and performance, presented in Table 5 (Naumova, 2020, p. 31).

Table 5.

Five-component structure of the learning effect

mental stability		mental confidence
	Training effect	
mental endurance		mental performance

The first parameter of the training effect of psychomotor activity is mental stability. Kozhevnikov (2018, p. 52) characterized mental stability as the emergence of a motor task, which, in turn, generates a motive that leads to the performance of certain motor actions aimed at its implementation. Further, the difficulty that causes a negative emotional state is understood. After that, there is a search for a way to overcome this difficulty, as a result of which there is a decrease in the level of negative emotions and an improvement in mental state, so mental stability is primarily self-control. In this regard, sports achievements are an indicator of the value of a person's useful expenses for self-improvement, an indicator of his success.

The second parameter of the training effect of psychomotor activity is mental confidence. The reliability of a person in the broadest aspect of this concept is interpreted as „the ability to maintain the necessary qualities in the face of a possible complication of the situation, the preservation, stability of the optimal working parameters of a person”. The mental certainty of a person in sports activity is determined by the totality of his mental and psychophysiological characteristics, which depend on the effectiveness of activity in extreme conditions and in a certain period of time.

An important parameter of psychomotor activity is the ability to work mentally. In various studies, it is considered as a property of a person to show the ability to perform certain work and as something similar to the functional state of the body and as the ability to provide a certain level of activity, work efficiency and the limiting capabilities of the body.

Physical performance is the potential ability of a person to show maximum physical effort in static, dynamic or combined work. In a narrow sense, physical performance is often understood as a functional state of the cardiorespiratory system.

The fourth parameter of the training effect of psychomotor activity is mental endurance. This is the ability of a person to perform any motor activity for a long time without reducing its effectiveness. Since the duration of work is limited by

the resulting fatigue, endurance can also be defined as the body's ability to resist fatigue. The criterion of endurance is the time during which muscle activity of a certain nature and intensity is carried out. In play activity, the time is measured during which a given level of efficiency of motor activity is carried out. An indicator of endurance is the stability of performing this action technically correctly.

The fulfillment of the social order of society – the comprehensive development of the child at preschool age and preparing him for school – puts the educator in front of the need to apply appropriate corrective methods and techniques for the prevention, control and analysis of the dynamics of changes in the child's speech development.

When the child is 5 years old, they should be able to copy the drawing of a square and draw a silhouette of a person. They are also adept at grabbing a pencil with a tripod position and tend to draw different images between the lines. In addition, children of this age should be able to wash and dry their hands well (Dosman & Andrews & Goulden, 2012, p. 567).

Results

In order to determine the level of development of motor abilities of preschool children in kindergarten No. 49 “Ak niet” research work was carried out. The study consisted of three stages: identification, formation, conclusion.

At the identification stage, the technique “Draw a simple line”, “Complex turns”, the technique “Letters that develop vision” were carried out for children of middle preschool age 4–5 years old from kindergarten. The study involved 25 children.

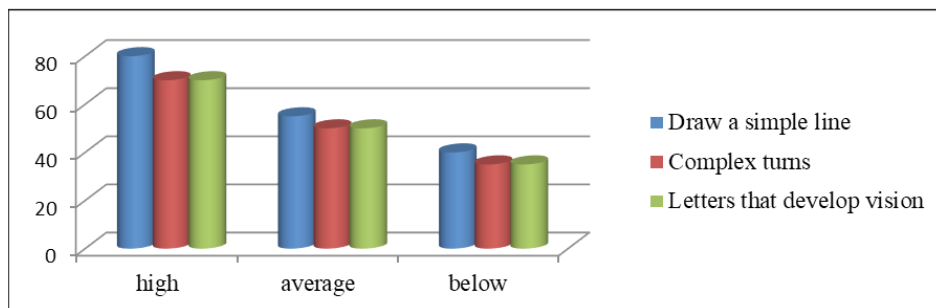


Figure 1. Definition step (source: own research results)

As a result, the experiment showed that children of four or five years old, unfortunately, have a low level of motor skills, which is clearly manifested in the

inability to draw a simple pattern, draw lines, and write a printed letter. It is noted that special attention should be paid to the development of fine motor skills of children.

For the development and improvement of fine motor skills of hands in children at the stage of formation, the following exercises were considered:

- sets of porous sponges (for training arm muscles);
- colored thread balls for return packaging;
- wooden toys (assembly of cubes of a locomotive, high chair, house, etc.);
- mosaic (gradually more difficult);
- sewing large and small beads, buttons;
- sets of ropes of various thicknesses for tying and untying knots;
- a set of mini-toys for the development of tactile perception (recognition of objects by tapping);
- plates with a bent layer of plasticine for drawing a pattern from fine gravel, cereals;
- knitting, sewing, embroidery;
- plastic or wooden sticks for laying patterns according to the sample;
- clay or plasticine stickers.

On the basis of finger games, finger gymnastics complexes have been developed that promote the development of fine motor skills, which were performed by children every week. In addition, various games and exercises were carried out for the development of large motor skills of the child, not paying attention only to fine motor skills, these are: exercise-developing games – “jumping ball”, “sun, sand and sea”, “figures”, “Telefax”, “Lullaby”, „Raindrops”, “King of Silence”, “Jump and Picture”, “Coins in the Well”, “Pinata”, “Sheet of Paper”, “Colored Planes”. Children actively performed game exercises and participated with interest.

At the final stage, the methods were repeated.

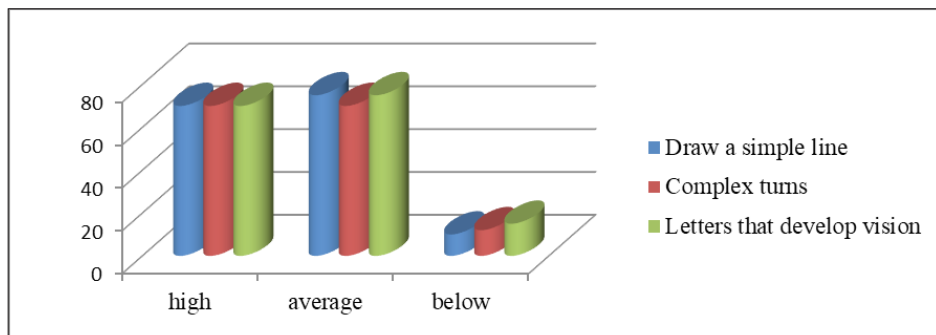


Figure 2. Final step (source: own research results)

The projection of the hand is closer to the motor cortex than the projection of other parts of the body. In addition, it is very close to the motor speech zone (Broca's zone). It is obvious that the training of finger movements is a stimulus for the development of the child's speech, and in general a powerful tonic factor for the cerebral cortex. Exercises and games allow you to develop memory and imagination, increase children's interest in learning activities. The research work carried out at the ascertaining stage of the experiment showed that the development of fine motor skills in children of the older group is weak, but not in all children. Many children cannot actively attract attention, while others, on the contrary, have relatively high stability and concentration.

Comparing the results of these two stages of the experiment, it is clear that the children have become more independent and attentive. Their activities were conscious, meaningful and purposeful. Finger games helped prepare hands for writing, develop coordination of movements, help children become free. With the help of these exercises, the children's fingers began to tighten tightly, relax easily, and stretch in different directions. In the second experiment, all the tasks given to the children were completed quickly and without any extra effort.

Conclusion

The main task of the family and kindergarten, along with the issues of education and upbringing, is the task of maintaining the health of children.

When studying the training effect of psychomotor activity, its significance lies in the ratio of mental stability, its ability, endurance and performance, which we confirm by summarizing the above views of scientists. The central backbone component of the structure of psychomotor abilities is associated with teaching the skills of psychomotor self-regulation, through which psychomotor abilities are formed and developed, taking into account inclinations, the success of psychomotor activity, the learning effect and the speed of learning. The surrounding world and self-change and transformation are improved through the gradual development of self-control, self-regulation, self-control, which results in self-development and the formation of a holistic personality.

The above is a testament to the wisdom of the practice of driving women into the countryside. Obviously, the development of psychomotor skills in children is carried out from preschool age through various developmental activities, games, and exercises. With the help of such methods, the brain not only develops motor skills in children, but also facilitates attention, perception, thinking, interest, relationships and actions in the environment, and the ability to behave in a group. Using a variety of games, the teacher has the opportunity to observe the abilities, skills abilities of the child.

References

- Alexandrova N.G. (1968). *Rhythmic education. Revolution – art – children*. Moscow: Enlightenment.
- Bezborodova M.A. (2010). *Development of psychomotor abilities of younger schoolchildren*. Moscow: Moscow Pedagogical State University.
- Bernstein N.A. (1961). On the construction of movements. next problems physiology of activity. *Problems in Cybernetics*, 6, 101–160.
- Dosman C.F., Andrews D. & Goulden K.J. (2012). Evidence-based milestone ages as a framework for developmental surveillance. *Paediatrics & Child Health*, 17(10), 561–568. DOI: 10.1093/pch/17.10.561.
- Kozhevnikov T.S. (2018). *Psychological foundations of conflict resolution: stock lecture*. Kirov.
- Kruk-Lasocka J. & Krajewski J. (2013). *Psychomotor 2. Movement full of meanings*. Wrocław: University of Lower Silesia.
- Kholodov Zh.K. & Kuznetsov B.C. (2003). *Theory and methods of physical education and sports: textbook. allowance for students. higher educational institutions*. Moscow: Academy.
- Lesgaff P.F. (1952). *Guide to physical education. Sobr. Ped. Works*. Moscow: State Publishing House “Physical Culture and Sport”.
- Merlin B.C. & Klimov E.A. (1996). *Psychology of individuality*. Moscow: In-t practical.psychol., Voronezh: NPO “MODEK”.
- Naumova T.V. (2020). *Development of psychomotor abilities of preschool children in the conditions of the information and educational environment*. Stavropol: North Caucasian Federal University.
- Nikandrov V.V. (2004). *Psychomotor: textbook. allowance for universities*. St. Petersburg: Speech.
- Ozerov V.P. (2009). *Psychomotor development of youth*. Monograph. Stavropol: Service School.
- Sechenov I.M. (1953). *Selected works T. 1*. Moscow: Uchpedgiz.
- Sekulowicz M., Kruk-Lasocka J. & Kulmatycki L. (2008). *Psychomotor. Movement full of meanings*. Wrocław: Lower Silesian School of Higher Education.
- Shadrikov V.D. (1997). *Human abilities / V.D. Shadrikov. – M.: Voronezh*.
- Shebeko V.N. (2010). *Theory and methods of physical education of preschool children: textbook. allowance for students of higher education. Started*. Minsk: Higher School.
- Teplov B.M. (1985). *Fav. works: In 2 volumes*. Moscow: Pedagogy.
- Verkhoshansky Yu.V. (1988). *Fundamentals of special physical training of athletes*. Moscow: State Publishing House “Physical Culture and Sport”.