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## **CHILD'S PHYSICAL ACTIVITY AS THE CONDITION OF BEING SUCCESSFUL IN LEARNING**

*Питання важливості фізичної активності піднімається у педагогічній літературі протягом довгого часу. Усе більше і більше вчителі помічають, що учні з потенційно сильними когнітивними здібностями не справляються з навчанням у школі. Ведеться пошук ефективних методів допомоги таким учням. Проте навіть метод, розроблений у якнайкращий спосіб, не є ефективним, якщо він позбавляє дитину її природньої активності і найбільш бажаної форми діяльності, такої як фізична активність. З метою сприйняття та обробки вражень, котрі надходять до дітей, мозку необхідно отримати настільки багато видів досвіду, наскільки можливо. Єдиним наявним способом є через відчуття. Це з їхньою допомогою мозок “вивчає” світ. У свою чергу, вони “відмежовують” знання від фізичної активності дитини.*

*Вопрос важности физической активности поднимается в педагогической литературе на протяжении долгого времени. Всё больше и больше учителя замечают, что ученики с потенциально сильными когнитивными способностями не справляются с учёбой в школе. Ведётся поиск эффективных методов помощи таким ученикам. Однако, даже метод, разработанный в наилучший способ, не есть эффективным, если он лишает ребёнка его природной активности и наиболее желаемой формы деятельности, такой как физическая активность. С целью восприятия и обработки впечатлений, которые поступают к детям, мозгу необходимо получить настолько много видов опыта, насколько возможно. Единственным имеющимся способом есть через ощущения. Это с их помощью мозг “изучает” мир. В свою очередь, они “отделяют” знания от физической активности ребёнка.*

*The importance of physical activity has been raised in the pedagogic literature for a long time. More and more teachers notice that pupils with potentially strong cognitive abilities for some reason do not well at school. The search for effective methods to help such pupils is under way. However, even the method, which is worked*

*out the best way possible, is not effective if it excludes a child from its natural actions and deprives it of the most desirable form of activity, i. e. physical activity. The brain, in order to receive and process impressions that reach it, needs to obtain as large number of experiences as possible. The only way they are provided is through our senses. It is with their help that the brain "learns" the world. In turn, they "draw" their knowledge from child's physical activity.*

The question of the importance of physical activity for the learning processes has been raised in the pedagogic literature for a long time. "The problem of lack of the natural methods of learning in educational systems has become a field of experiments of many well-known educators and researchers. They pointed out the importance of senses activity for the proper brain functioning" (D. Dziamska 2005, page 6). The link between use of senses and motor activity, constituting an indispensable indicator of development processes, was emphasised, among others, by Jean Piaget (J. Piaget 1992). He drew attention not only to the level, but also to the form of activity. This subject matter appeared also in the texts by Maria Montessori and Ovide Decroly. Recognizing the role of movement in the emotional and social development, Veronica Sherborne worked out a "Method of Developmental Movement". The importance of movement for school skills was proved and described, among others, by Neil Kephart (perceptual and motor system), Sally Goddard-Blythe (INPP programme), P. Pheloung (Movement for learning) and Jane Ayers (sensory integration).

For more than ten years the awareness that the movement development disorders may pose a significant cause of school failures of some pupils has increased among therapists working with children who have learning problems. At present it is a particularly important issue in Poland, as the six-year-old children have been covered with compulsory education. Further success of the children at subsequent stages of their education depends on the reliable evaluation of their school readiness (including evaluation of movement development) and effective support. The latest Regulation of the Minister of Education obliged the elementary education teachers to detect at early stage the risk of school failures of pupils and support them according to their needs. It is estimated that approximately 20 per cent of pupils in Poland require pedagogic therapeutic intervention in order to meet the average school requirements (A. Olechowska 2011). Learning difficulties are often caused by neurological factors. According to the U. S. National

Institute of Mental Health, neurological and/or neurodevelopmental factors are causes of the intensified learning difficulties in approximately 15 per cent of the people (by: A. Olechowska 2011).

Problems of such pupils and their families are adequately described by Dr. Sally Goddard: "(...) a happy child starts its education at school. Previously, it could encounter a lot of less significant difficulties such as feeding and sleeping problems, frequent ears, nose or throat infections, delayed achievement of developmental milestones such as learning to walk or speak, but these early symptoms were rarely treated as signs of problems that were to arise in the following school years. (...) The early warning signs that were evident in the developmental research disappear within the system at the moment of starting education at school (...). At the end of first grade the teacher may inform the parents that their child has difficulties with reading, small motor activity or, which happens even more often at this stage, with attention, calm sitting in its place, cooperation and social skills. They are often perceived as the basic problems with behaviour, requiring behavioural interactions, however, in the case of a child with developmental delay the problems are often symptoms of physical immaturity, which influences attitude, ability to sit calmly, development of independence from distractions, control over impulses and ability to read and respond appropriately to non-verbal messages of other people" (S. Goddard-Blythe, 2011).

J. Krajewski and A. Modrzejewska (2005) from the University of Physical Education in Wroclaw carried out a study of school readiness of children with delayed psychomotor development, which showed that the physical fitness of those children was deemed to be insufficient and lower than others. This was confirmed by the results obtained by this group of children, who were only at satisfactory or low levels, and their results didn't exceed the average test score of 200 points (Wroclaw Physical Fitness Test for preschool-age children (3-7 years old), B. Sekity, 1988). The overall level of school readiness of children was insufficient to regard them as fully prepared for school. The results obtained by children from this group indicated that there was a need for individual care aimed at filling the noticed gaps in the intellectual, social and health scope. After a detailed analysis of school readiness, the gaps in four fields (comparisons, writing, counting and reasoning) were noticeable even more clearly to the disadvantage of children from the study group. The greatest differences in relation to the group of remaining children were noticed in the area of readiness for writing

and readiness for counting (School Maturity Test (DS1), B. Wilgocka – Okoń 2003). Accurate, multi-factorial analysis of the results obtained by the study group of children, in all areas, reflects the magnitude of individual deficits, occurring in a particular child (J. Krajewski, A. Modrzejewska 2005). The studies presented above confirm the inseparable connection between motor development and achievement of successes at school by a child.

More and more teachers notice that pupils with potentially powerful cognitive abilities, for some reason do not well at school. Initially such difficulties manifest themselves in an incorrect writing grip, a bad position at a desk, learning to read and write. Later the problems with visual perception, sense of space, reluctance to physical exercises occur. Initially underestimated problems, which are not seldom reflected with the statement saying that after all not every boy is Beckham and not every girl is a prima ballerina, gradually grow to such an extent when it is difficult not to notice them anymore. Unfortunately, both parents and teachers still fail to see the connection between motor activity and cognitive functioning together with graphomotor skills.

Dr. Sally Goddard-Blythe quoted above contests that in the Great Britain "physical development of a child is not an essential part of training for teachers" (S. Goddard-Blythe 2011, page 12). When during the lectures conducted by her she asked trainee teachers how much time in the course of their education they spend on learning about the child's physical development, no hand was up. A few hands rose when Piaget's developmental stages were mentioned, however, in her opinion, only integrated learning teachers properly understand the importance of the sensomotoric development for further cognitive functioning. Meanwhile, "child's education during the whole process of education remains rooted in its physical development from the moment of conception. The abilities of balance, posture, coordination and adequate visual and auditory perception are of fundamental importance for effective learning, but they do not belong to the scope of the skills subject to the standard evaluation on the eve of starting school education by a child" (S. Goddard-Blythe 2011, page 12).

During the pedagogic workshops for English teachers conducted by us we had the similar impression. Participants of the workshops (43 persons), answering the question "What type of classes does a child with graphomotor disability need?", responded unanimously that "it needs to spend more time on calligraphy". Only 2 persons were able to list

properly the stages of development according to Piaget, 7 persons had heard about sensory integration, 3 persons were able to list all senses, no one associated child's school problems with its motor activity. One of the participants asked the following question: "Do you think that it is reasonable that a child who has problems at school should spend more time on the playground than at the books?" Moreover, after the workshops we conducted the following question was raised repeatedly: "Why did no one ever tell us about it before?"

Activities aimed at a comprehensive support induce to look for methods ensuring broad development of a child. However, even the method that is developed in the best possible way will not be effective if it excludes a child from its natural actions and deprives it of the most desirable form of activity, i. e. motor activity. The brain, in order to receive and process impressions that reach it, needs to obtain as large number of experiences as possible. The only way they are provided is through our senses. It is with their help that the brain "learns" the world. In turn, they "draw" their knowledge from child's physical activity. The brain and the nervous system are constantly changing under the influence of various stimuli. Learning and development processes are directly dependent on the diversity and variety of stimuli, influencing the level of stimulation.

The ability to receive, process, modulate and combine the sensory experiences, i. e. so called sensory integration, constitutes the basis for the proper development of every human in the field of thinking, speaking, emotions and social interactions. Looking at a child riding a bike, who overcomes obstacles, spins circles, knows how to ride around a friend and not to crash on them, knows where to slow down, where to speed, how to ride along a designated route rather than over pools, parents often do not realize that such adjustments to the situation are known as the adaptive responses. This is a complex skill, arising from the merger, i. e. integration of the properly processed impressions coming from the sense of balance (vestibular system), deep sensibility (proprioception), superficial sensibility and sense of sight.

What depends on the proper functioning of the vestibular system is, among others, postural tension, i. e. muscular tension that enables a child to resist the force of gravity without difficulty, keep the balance while carrying out a series of movements, such as leaning over to pick up a pen that fell on the floor. It also enables to maintain the sitting position without effort and feeling discomfort, as well as to track

smoothly a moving object without the need to move one's head, for example when a child draws, reads, writes, etc.

Proper operation of the vestibular system must be lined with the impressions coming from other senses. Deep sensibility impressions (received from the muscles, joints and tendons) allow the child to feel the position of its body parts in respect to each other, as well as their position in the space in respect to the surrounding. In conjunction with the visual impressions they enable the child to estimate distance, speed and choose the right moment to make a movement. Superficial sensibility, in turn, enables the child to receive the impressions of softness, hardness, smoothness, warmth, cold or to recognize the shape and differentiate these impressions. This sensibility gives you knowledge of whether something is threatening or indifferent – does the child hold a pencil or a stick, or maybe a carrot? Adequate interaction of all sensory systems enables to be successful at school.

In the sixties of the twentieth century, Dr Jean Ayres, psychologist and occupational therapist from the Institute for Brain Research at the University of Los Angeles, formulated a theory of sensory integration dysfunction, which was subsequently confirmed in many studies. According to J. Ayres sensory integration therapy is addressed to children with subtle neurological abnormalities that arise from abnormal organization of the nervous system and the areas of perception of sensory stimuli. Organization is essential for creation and integration of the correct sensory information. Violet Maas (1998), who introduced the sensory integration in Poland, determined the following list of symptoms, which are present in children with learning difficulties and associated with sensory integration disabilities:

- delayed (slower) physical development,
- difficulties with keeping balance,
- reduced muscle tension,
- disorders of eye-motor activity coordination,
- ugly hand-writing, incorrect pencil grip, reluctance to draw,
- improper posture during writing, reading,
- difficulties in spatial orientation and body schema, right-left side,
- impaired attention concentration,
- difficulties in performing two or more commands,
- impaired visual and auditory memory,
- slurred speech,
- reversing words and letters by children over 7 years of age,

- difficulties in distinguishing shapes, colours,
- withdrawal from tasks that require precision of movements,
- difficulties with movements planning,
- impulsivity in behaviour,
- psychomotor hyperactivity,
- shyness and slowing down,
- withdrawing attitude,
- low self-esteem,
- low level of tolerance to stress.

Z. Przyrowski (2001) points out that sensory integration deficits occurring in children with learning difficulties include disorders of stimuli registration and processing, mainly within three fundamental sensory systems: vestibular, proprioceptive and tactile. Such deficits manifest themselves in the dysfunctions in the following scope:

- postural reactions (defensive, equivalent and postural in the background),
- eye-motor functions,
- muscle tension, body schema, difficulties in movement planning,
- dysfunctions in bilateral motor coordination and sequencing. The above mentioned motor-eye dysfunctions will mainly consist in:
  - difficulties in tracking a moving object, the movement will be then less fluent and uncoordinated,
  - losing sight of the object and difficulties of recapturing it,
  - not keeping up with the object,
  - trying to make movements with one's head instead of eyes,
  - frequent blinking or squinting,
  - difficulties in crossing the center line of the body.

These disorders result in difficulties in learning to read, a reduced graphic level of hand-writing, writing errors consisting in the exchange of the letters, which are similar, but placed differently in space (b-d, b-p, etc.), difficulties in differentiating the right from the left side, as well as poor bilateral motor coordination. These typical difficulties are also accompanied by emotional disorders, difficulties in attention concentration and psychomotor hyperactivity (Z. Przyrowski 2001).

Therapy of sensory integration dysfunctions has the form of a “scientific game”, in which children participate willingly and co-create the workshops together with the therapist. Children are not taught specific skills, but their sensory stimuli integration is improved by stimulating the nervous processes underlying these skills. Then



the appropriate emotional and motor responses occur naturally, as a consequence of improving functioning of the central nervous system. Therapy is carried out by performing a variety of exercises such as: "cradle" on one's back, done on a mattress: forward-backward, sideways, "cradle" on one's abdomen, rocking in a chair/a rocker/a semi-roller with open/closed eyes, rolling over on a mattress with fixation of one's sight on an object, jumping: on both feet, on one foot, skipping from foot to foot, forward, backward, jumping on one's axis, jumping over a stretched elastic band, jumping at selected locations, crouching on hands and knees, pulling/lifting one or two limbs and keeping balance, on the floor, on the soft mattress, walking along the extended line, walking foot for foot, walking on a bench while holding the object in one's hands, walking on a bench and going over the bag lying on the bench, playing the "ball" game, lying on your back and doing "the eagle" in snow, doing the star jumps, games with clapping, rhythm clapping, rhythm repetition, rhythmical bouncing a ball with both hands, bouncing a hanging ball with both hands – holding a stick or a racket, throwing the ball with both hands, kneading the dough using both hands (salt dough), squeezing sponges, wringing towels, painting using two brushes simultaneously.

The above-mentioned suggestions of exercises are mostly motor games based on the natural activity of children. In times when the computer was associated only with a huge machine to count, located in a few rooms, children, spending time on playgrounds stimulated their sensory systems in a natural way, and were not guided by any philosophy or scientific evidence. Nowadays, 12-year-old children, who come for therapy are not very fit from the motor point of view, they prefer a sedentary lifestyle. Therefore, the most appropriate thing to do is to increase their physical activity instead of the tasks fulfilled sitting at the tables. Meanwhile, the average Polish child spends two and a half hours per day watching television, and on Saturdays – over three hours, according to TNS OBOP /Centre for Public Opinion Research/ research, which "Gazeta Wyborcza" daily refers to. 1200 children aged 4-15 years participated in the research of TNS OBOP. Children follow the example of their parents, who spend approximately 3 hours and 58 minutes a day with a remote control in their hands. It is even worse on Saturdays and Sundays, when the average Pole sits in front of TV for 9 hours and 17 minutes ("Gazeta Wyborcza" of 28<sup>th</sup> May 2011).

Learning difficulties are accompanied by the symptoms that often



include motor disorders – insufficient overall motor fitness and/or low motor ability within the articulatory apparatus, as well as improper planning and arranging movements of hands and fingers while performing manual or graphomotor activities (A. Olechowska 2011). Therefore, it is legitimate to develop motor skills as the ones underlying human development, including, but not limited to the ones constituting basis for achieving success at school. In the process of education of future teachers it is also extremely important to draw attention to the exact knowledge of child's developmental periods and to associate the observed motor disability with potential learning difficulties. It is also necessary to balance the emphasis in the school systems, which is presently put on mental development, with the one enabling simultaneous development of appropriate motor skills.

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