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## **THE IMPORTANCE OF PHYSICAL EXERCISE IN THE PROCESS OF LEARNING AND TEACHING OF CHILDREN AT YOUNGER SCHOOL AGE**

## **ZNACZENIE RUCHU W PROCESIE UCZENIA SIĘ I NAUCZANIA UCZNIÓW W MŁODSZYM WIEKU SZKOLNYM**

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**Abstract:** This article focuses in particular on the close correlation between physical exercise and the process of learning. Conscious and intended use of physical exercise increases children's cognitive possibilities and supports the influence of school education on pupils. Even though there are already some studies concerning the above mentioned issue, the correlation between cognitive and emotional-motivation processes and physical exercise is not always appreciated and used in practice. Such marginalization of the influence of physical exercise on learning and teaching of children results not only in lower effectiveness of education, but it also gives rise to even more problems connected with difficulties in learning and behavioural disorders of the younger school age children. This article presents also the results of the research concerning opinions of early school education teachers on the use of physical exercise in the process of teaching of younger school pupils. The research aims, among others, at discovering the methods and techniques based on physical exercise that are used for teaching youngest pupils.

**Keywords:** activity, physical exercise, early school education, process of learning, motivation, emotions

**Streszczenie:** W artykule zwrócono szczególną uwagę na to, że istnieje ścisły związek między aktywnością ruchową a procesem uczenia się. Świadome i celowe wykorzystanie ruchu zwiększa możliwości poznawcze dziecka oraz wzmacnia nauczanie i oddziaływanie szkoły na uczniów. Mimo istnienia naukowych badań dotyczących powyższego zagadnienia związek procesów poznawczych i emocjonalno-motywacyjnych z aktywnością ruchową nie zawsze bywa doceniany i wykorzystywany w praktyce. Marginalizowanie pozytywnego wpływu aktywności ruchowej na uczenie się i nauczanie dzieci skutkuje nie tylko niższą efektywnością edukacji, ale także pojawieniem się coraz liczniejszych problemów związanych z występowaniem trudności w nauce i zaburzeń zachowania u uczniów w młodszym wieku szkolnym. W artykule zaprezentowano również wyniki badań dotyczące opinii nauczycieli wczesnej edukacji na temat wykorzystania przez nich ruchu w nauczaniu i uczeniu się młodszych uczniów szkolnych. Celem badań było między innymi poznanie, jakie nauczyciele stosują metody i techniki oparte na ruchu w nauczaniu najmłodszych uczniów.

**Słowa kluczowe:** aktywność ruchowa, edukacja wczesnoszkolna, proces uczenia się, motywacja, emocje

## Introduction

Education is the field that requires constant and intensive changes, so that contemporary teaching can face up to dynamically changing reality and meet the needs of changing society. But, above all, it needs to be adjusted to pupils' needs and expectations. Obviously, it is necessary to transfer knowledge and skills in an interesting way, create opportunities to solve problems creatively, teach through acting and experiencing the world as well as develop children's interests.

As indicated by many researchers (Diamond, 1988; Spitzer, 2012; Hansen, 2018, Dumont and others), there is a close relation between physical exercise and the process of learning. Conscious and intentional use of physical exercise increases cognitive possibilities of children, supports the process of teaching and the influence of the school. Despite the existence of some scientific research concerning abovementioned issue, the relation between cognitive, emotional-motivation processes and physical exercise is not always appreciated and it is not frequently used in school practice. Such marginalization of the positive influence of physical exercise on learning and teaching of children results not only in lower effectiveness of education, but also in a growing number of problems related to difficulties in learning and behavioural disorders of pupils.

Despite numerous and constant reforms, the education in the majority of Polish schools is still the 19<sup>th</sup> century education system, which was created for the needs of industrialization. The main aim of education in that period was to form obedient and disciplined workers for factories – in other words – a lot of reconstructive workers. Education is still dominated by schematic approach; pupils learn the world divided by particular subjects; encyclopaedia knowledge and task approach prevail. Activity of pupils is determined by the bell; all the children, irrespective of individual interests, background knowledge and possibilities, have the same time to acquire particular knowledge and skills.

Bearing in mind that the school system is stuck in the 19<sup>th</sup> century, there are numerous results of civilization development, increasing children's adaptation difficulties and emotional development disorders, increasing children's problems with acquiring knowledge and skills, it is necessary to look for a new model of education that will be effective in terms of praxeology. The school must resign from passive education and must use the results of scientific research in order to organize the space where children's activity is most important and their independent attempts to solve problems are the top priority.

## **Physical exercise in the process of learning**

Physical activity is a natural need of childhood that should be fulfilled and it helps to maintain health of individuals and whole communities (Przewęda, 1999). It is a necessary element of healthy behaviours. However, due to development of civilization, in many cases the physical exercise and efforts related to various everyday activities have been eliminated, which has adverse effect on human health. The importance of physical exercise for development of child's personality was demonstrated by educationalists who lived at the end of the 19<sup>th</sup> and the beginning of 20<sup>th</sup> century, among others: the Austrian Rudolf Steiner (1861-1925), the Swiss Emil Jaques-Dalcroze (1865-1950), the Hungarian Rudolf von Laban (1879-1958) and his follower Veronika Sherborne (1922-1990), and others.

Even Aristotle told his disciples to walk when he was teaching. He had a very good intuition, which has been proved by today's research made by neurobiologists confirming that physical activity influences cognitive processes. The brain has become the subject of investigation of psychiatrists, psychologists and educationalists. It is known that the brain works and learns more effectively when it has favourable conditions. In the middle of the 60's, professor Marian Diamond (1988, 1999), as one of the first researchers, discovered and described neuroplasticity of the brain, which is the ability of nervous tissue to create new connections for the purpose of their reorganization, adaptation, changing and self-repair, as well as the processes of memory learning – in other words, its ability to change. On the basis of the studies with the use of rats, which were kept in various environments – enriched and poor – she proved that the environment changed anatomy, physiology and functioning of the brain. The structure of cerebral cortex changes at any age, from prenatal period to old age, and the environment plays an important role (its enrichment causes the increase of the ability to learn and the other way round). She defined five factors improving functioning of the brain, which were: diet, physical activity, challenges and innovation (overcoming difficulties and solving new tasks), love. Thus, the experience changes the brain. Research by M. Diamond showed also that the brain could develop at any age, therefore she encouraged people to mental and physical activity, which have a positive effect on development and condition of the brain.

Anders Hansen writes that construction of the brain requires physical exercise. The scientists collected data of 3200 young American people regarding their physical activity and the time they spend watching television. Moreover, they were also covered by psychological tests that examined memory, ability to focus and speed of processing information. The studies showed that those who spent a lot of time in sitting position manifested worse ability to focus and memory and also thought more slowly (Hansen, 2018, p. 97).

Exercise is an indispensable element of childhood as written by German Reiner Patzlaff, a specialist in the scope of preschool and early school pedagogy. He expressly states that *the person who eliminates exercise, deprives the child of the most important activity. This type of suppression of rights is called deprivation by psychologists. It is a robbery in terms of children's development and this robbery has such serious consequences that should be called a form of violence* (Patzlaff, 2015). The author draws our attention to the fact that due to passive consumption of media programmes and civilizational changes more and more children have disturbances of mental processes, difficulties with listening, focusing attention, feeling own emotions, finding their place in the environment etc. A young person spends his or her free time in the front of television or computer screen, spending there more than 30 hours each week. At the beginning of the week such child has difficulties to listen to the teacher in the school (Monday syndrome). A deluge of digital information forces the brain to cope

with them even though the brain has not changed since several thousands of years. Therefore it is more and more difficult for us to focus and we need help to take control of the stream of information (Hansen, 2018, p. 99).

Although there are hundreds of studies that underlines salutary influence of physical exercise on memorizing and learning, we still force seven-year-olds to sit at the desks for 45 minutes. There was a famous experiment conducted 10 years ago by John Ratey, American psychiatrist. He introduced aerobic exercises at school every morning. After coming to school the children, instead of sitting at the desks, were going to the gymnasium to run for 40 minutes. The effects quickly made themselves felt. At the end of school year they grades were much higher and the children from neglected environments achieved the results equal to other children who attended exclusive schools.

### **Research on use of physical exercise in the process of learning and teaching pupils in younger school age**

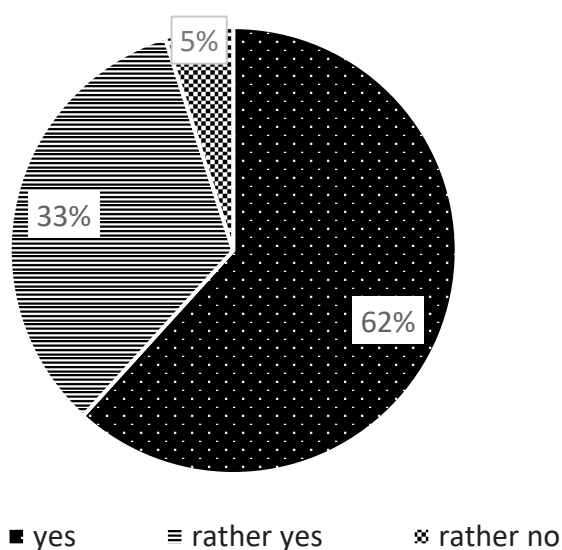
Taking into account the analysis of scientific literature, the author's own experiences and observations, a question arises: Are the early school education teachers aware of the importance of movement in education of younger school pupils? Do they know and apply methods using physical exercise while teaching youngest pupils? Are they interested and ready to increase their skills within the scope of the use of physical activity for the purpose of increasing effectiveness of education?

In order to answer to these and other questions, taking into account educational requirements, the needs of today's pupils and knowledge about the development of the brain, the author conducted research concerning use of physical exercise in education of younger school pupils. The purpose of the research was to learn some methods and techniques based on physical activity that were applied by teachers for teaching youngest pupils as well as to diagnose the process of teaching in early school education and to collect knowledge on teachers' readiness to increase their qualifications within the scope of the use of physical activity in education of youngest children.

The research used the method of diagnostic survey. Within its scope, an Internet survey questionnaire was used as a research tool, which consisted of 15 questions. The study was conducted in March 2020. The survey was sent to 300 people and 81 early school education teachers responded, among them 48% working in schools in rural areas and 52% in urban areas. The biggest group (73%) was constituted by teachers with highest professional advancement degree, which meant certified teachers; the smallest group comprised teacher trainees (7.4%) and 10% worked as contract teachers and nominated teacher.

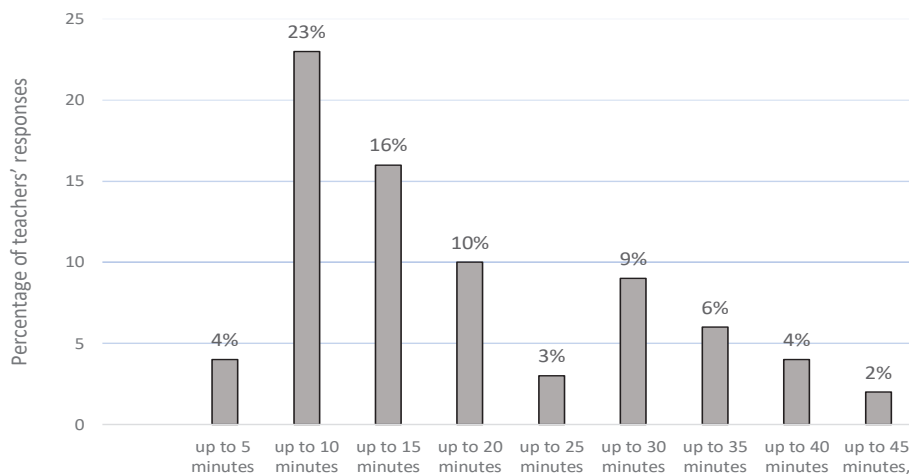
The majority of the respondents (graph 1) use some working methods with the use of physical exercise during early school education classes. It can be stated that the teachers are aware of the pupils' need for physical activity during classes, which enables them to better absorb new knowledge and skills. However, the teachers often do not have the skills and motivation strong enough to implement positive changes in practice. Rooted personal habits and reluctance to physical exercise causes that they rarely apply physical exercise in education.

**Graph 1.** Use of physical exercise by teachers during early school education classes



**Source:** own's study.

Analysing the data (graph 2) concerning the time spend for pupils' physical activity every day, apart from compulsory physical education classes, it should be stated that pupils are not very active. The majority of the teachers – around 20% spend up to 10 minutes for physical activity. The time up to 35 minutes refers only to slightly more than 5% of the respondents. Taking into account that it is a golden period for the development of motor skills of children and considering the data about the influence of physical exercise on development of the brain and learning, it is definitely an insufficient share of physical activity in the process of learning.

**Graph 2.** The time the teachers spend for pupils' physical activity every day (apart from physical education classes)

**Source:** own's study.

In the survey, the teachers were asked to mark three forms of activity they used most frequently during classes. In fact, 68% of the teachers indicated relaxation exercises that aimed at lowering mental and physical tension and improving overall well-being. Around 53% of the teachers used plays with dance, which, again, was a pause in learning rather than a method combining motor activities with cognitive ones. Almost half of the teachers (48%) were going out to the sports field, which was also a form of a pause, 40% of the teachers apply games and playing with a ball.

Among other activities, around 13% of teachers mentioned movement games with music and 6.7% mentioned: mathematical plays, Zumba, integrative plays, breathing exercises, role playing.

The study showed that teachers did not link physical activity with the cognitive process. They used physical activity not as a method of teaching, but as an active break.

Regarding the methods based on physical exercise, among which the teachers were to choose three, almost half of the respondents confirmed that they used Sherborne Developmental Movement (SDM), which was developed in the 60's. It is now applied in supporting normal children development and correcting its dysfunctions (Sherborne V, 2019). The essence of this method is the use of physical exercise as a tool to support psychomotor development and developmental disorders therapy. The idea of Sherborne's exercises is rooted in fulfilling natural needs of the children, most often in contacts with adults. Its author mentions several categories of physical exercise:

- movement that helps the person become aware of what is happening to their body;

- movement that develops the relation between the individuals and their physical environment – this category of movement aims at developing spatial orientation;
- movement that leads to relation with other people, develops trust and builds positive relation with them;
- movement that leads to cooperation in a group; it consists in adaptation of own moves to the moves of partner and a group;
- creative movement – it is a spontaneous movement – a free dance. It is to help express “oneself” in a creative way;
- improvement of movement fluency and the sense of body weight in space and time.

Thus, the teachers can use a modified version of SDM during classes (Sherborne, 2019).

The research reveals that 44.4% of teachers apply Educational Kinesiology. It is a method of American philosopher and teacher, P. Dennison. It is based on alternate movements, lazy eights, drawing alphabetic letters or elephant with both hands, diaphragmatic breathing and so on. Positive results of this method include the improvement of smoothness and flexibility of movements in the field of small motor skills, improvement of visual-motor coordination, vision, hearing, writing, improvement of laterality and learning to read (Hannaford, 2015).

The third most frequently used method in the opinion of early school education teachers (42%) is Education through Movement (ETM) of Dorota Dziamska. It is a kinesiology way of education and therapy, which is a collection of various techniques and methods of work with a child that uses natural moves of the body in the process of learning. (Dziamska, Teoria systemu EPR, <http://www.pracownia.origami.org.pl>). It is a functional education, where the starting point in the system is the planning of rhythmic movement as the basis of the child's cognitive activity. As written by D. Dziamska, “the teacher who leads the classes with the ETM system uses some simple or more complex forms of exercise in line with physiology and psycho-motor possibilities of the children and the play created in such a way is based on so called competency of “rhythmical beats.” (Dziamska, Teoria systemu EPR, <http://www.pracownia.origami.org.pl>). The ETM system is built of many techniques that have particular functions. The creator of the system, D. Dziamska, developed the methodological solutions from the theory of sensory integration by Jean Ayres, according to whom the brain received information from all the senses and then it sorted, integrated, recognized and interpreted them, so that they could be used in purposeful and effective actions (Ayres, 1972).

In the system of D. Dziamska the exercise is made with appropriately selected music, which determines rhythm and gives rise to children's natural need for activity. Combination of exercise with learning new environment and oneself takes place through play of a cognitive nature. During such exercises children perform



some activities (for example drawing, painting, folding paper), which is an element of play and allows children to acquire new experiences. During such plays related thematically to one another, the children make some works, which create a whole at their final stage. Children's product is used for further work with children, it functions as cognitive element and provides new material that can be experienced, analysed, synthesized, and in this way it expands their knowledge and allows to practice new skills. Due to the fact the children has made such work by themselves, their need for self-actualisation is fulfilled and their sense of success is built.

The examined teachers assessed their own preparation as very good as far as the use of exercise in the process of pupils' education was concerned. In the scale from 1 to 5, assuming that 1 was the lowest grade and 5 – the highest, more than half of the respondents gave the grade (4) and almost 15% – the highest grade (5). Nobody among the respondents chose for himself the lowest grade (1), even though the catalogue of methods and techniques based on physical exercise they mentioned was not particularly diversified and it did not include any innovative forms of work with pupils.

Despite high assessment of own competencies within the discussed scope, 37% of the respondents is definitely interested and 45% rather interested to participate in the trainings on: The importance and use of exercise in teaching younger school age pupils. So, it is noticeable they are aware of the need of constant improvement of their skills and necessity of learning new methods and forms of work based on the use of physical activity of pupils. 11% of the respondents had no opinion on this topic and around 7% did not want to be trained in this field.

Regarding the open question about the method of teaching (or type of the classes) the teachers were interested in, 69% of them did not mentioned any method. Hence, it might be assumed the teachers did not know even the name of the method, so in fact they did not know what they could learn. The rest of the respondents (4 persons – 4.9%) mentioned such methods as: Sherborne Developmental Movement, Education through Movement of Dziamska, Dennison's Educational Kinesiology. Even less people (only 3 persons – 3.7%) indicated such methods as circus pedagogy, movement, speech and music therapy. However, it should be noticed that all above names were placed in the text of the survey.

## **Conclusions and pedagogical suggestions**

Taking into account the results of empirical studies, it can be clearly stated that physical activity of the pupils is the basis of their effective education. Physical activity improves both basic cognitive functions such as memory as well as more complex processes, such as reasoning and decision making and, finally, it translates into intelligence, school results and social relations.

Application of the teaching methods based on movement is indispensable. As it has been mentioned, physical activity improves all cognitive skills of human being (Hansen, 2018 p.160). To enable a person to learn constantly new knowledge, the process of education should be adjusted to physiology of the brain, psyche and individual predispositions of the pupil. The ability to learn quickly is one of the generic skills, which are often defined as competencies independent on particular school subject or as interdisciplinary competencies. They are not related to any particular discipline, but they are applied in many spheres of life; they are necessary at work and in everyday life.

Observing<sup>1</sup> the way children are taught and the results of the presented studies, it is possible to come to conclusion that the school does not sufficiently use the simplest and simultaneously the most effective methods of learning based on movement. It is important to change not only the way of thinking of teachers but also parents' mentality. Due to rooted traditional approach to the role of the school as a foundation for better life very often both teachers and parents forget about happy childhood. Looking to happy tomorrow, they forget about today. We treat school as a transitional stage, which helps achieve something more. But the childhood is a crucial stage, which determines formation of personality. Therefore, it is necessary to create space where the children feel good, are happy, can develop their talents and interests and can be physically active in line with their developmental needs. Thus, it is good to allow children active playing related to analysed topic during learning.

It is necessary the teachers have knowledge about facilitating and hindering factors in learning and be able to use it in practice. It is recommended that future teachers have high level of psychological knowledge within the scope of children development, ability to motivate them and modern didactic (including neuro-didactic), but they also need to display high level of their own psychological competencies. The important element of teachers' qualifications is their methodological preparation within the scope of applying such methods of work and organizational forms in the didactic process that correspond to current challenges of education. In other words, the educational process should be organized on the basis of motor needs of children, with the use of stimulating methods of teaching and creation of atmosphere that support well-being, participations and activity of pupils during classes.

Summing up, for the purpose of more effective teaching of children it is necessary to create safe environment where children feel loved, have all their emotional needs fulfilled and is physically active. At the same time, this environment should be dynamic, allow to expand their personal experiences, lead to analysis, reasoning, as a result of which a new knowledge is created (Klus-Stańska, 2010, p. 313). It means departure from learning by following a line. The teacher puts the pupils in a situation

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<sup>1</sup> The author is a teacher of twenty years' standing in early school education.

of cognitive conflict. To solve it, they must use systemic reasoning. As written by D. Klus-Stańska: "In this way the thesis is confirmed that creation of active cognitive structures possible to be used in new situations requires not total resignation from transferring of knowledge, but rather the change in frequency of its occurrence (after activation of procedural knowledge)" (Klus-Stańska, 2010, p. 315). It is essential that the topics of undertaken activity should result from questions asked by children and events that arouse the cognitive curiosity. Not only the goal, but the process of acquiring knowledge is important. The pupils must have the feeling of self-effectiveness that they are able to discover something, explain it and describe. Teachers and parents cannot strive to facilitate children's learning because, paradoxically, the lack of challenges makes it difficult for the brain to learn.

At a time when knowledge has a very short life and we are overloaded by information (Babik, 2010), the teacher's task is not only to teach, but also to show children how to learn, so that the learning can be effective. The school is the place that develops a way of learning and acquiring skills, especially at the first educational stage. The teachers' task should be to intensify activities increasing children's interest in the methods of effective learning and to form a belief that physical exercise is a learning partner.

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