RUCH, WZROK, SŁUCH – PODSTAWA UCZENIA SIĘ

MOVEMENT, VISION, HEARING - THE BASIS OF LEARNING

Redakcja/Editet by Ewa Maria Kulesza

Wydawnictwo Akademii Pedagogiki Specjalnej im. Marii Grzegorzewskiej

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Warszawa 2011

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Warsaw, Poland

MOVE TO LEARN PROGRAMME IN POLISH EDUCATIONAL PRACTICE

Results of pilot studies conducted in 2008–2010 as part of project *Methods of Neurodevelopmental Retardation Therapy of Children in Pre-School and Early School Age* financed with resources assigned to own studies of The Maria Grzegorzewska Academy of Special Education

It is being estimated that ca. 20% of pupils in Poland require therapeutic pedagogical intervention, so that they can fulfil average school duties. Neither lowering the school age, nor therapies used in learning difficulties used up to date seem to be effective. Sally Goddard Blythe noticed that it is true that many children overcome the childhood difficulties as there are many various deviations from the norm in the developmental process. However, there is a group of children who seem to be "fine", but who are immature in other aspects of development. If such immaturity is prolonged, there exists a possibility that such a child will face many difficulties with learning and behaviour at different stages of development (Goddard 2004).

Learning difficulties very often have neurological background. According to American National Institute of Mental Health neurological and/or neurodevelopmental deficiencies are the cause of learning difficulties (of various strength) in about 15% people with such difficulties.

Retained primitive reflexes are one of the syndromes of a retardation or neurodevelopmental disorders. They hinder further correct motor development and learning as well as reaching the freedom of movement (*inter alia* Paine 1964; Capute, Shapiro, Palmer, Accardo and Wachtel 1981; Morrison 1985, Fawcett and Nicholson 1994).

According to scientists, over 70 different primitive reflexes have been identified so far (Illingworth 1987). Basically, all of them should disappear (inhibit, mature) by the time the child is 1 y.o. However many of them is also present even in adults.

The reflex that is most popular in retained form in children with neurological impairment is the asymmetrical tonic neck reflex (ATNR) (Paine 1964).

The process of maturing of the reflexes in the first months of life has not been studied sufficiently, however it is generally assumed that it should not occur after the child is no longer in their early childhood. Moreover, it is still unknown to what extent the inhibition of the primitive reflexes is a part of the process of maturing controlled by internal mechanisms and to what extent it is conditioned by external factors influencing this process (Mc Phillips, Hepper and Mulhern 2000).

Infants development is in most cases stereotypical (Thelen 1979 and 1983) as it passes through next stages of primitive reflexes system. Foetus and infant's early moves, which were previously considered to be a passive "by-product" of a quickly developing nervous system, are now considered to be interactive and important when it comes to structural and functional shaping of the central nervous system (CNS). It is assumed that repeating movements characteristic for a certain primitive reflex can take (partial) part in accelerating one's development (Prehtl 1984). Therefore it is being checked, whether special motor programmes could help people with retained primitive reflexes (especially children with learning difficulties) to improve their functioning and level of educational achievements (Mc Phillips, Hepper, Mulhern 2000).

According to Anna Grabowska, PhD "we lack good diagnosis methods and therapies of various disorders and dysfunctions, such as ADHD, dyslexia or various behaviour disorders [in Poland]. On the other hand, parents and circles working with therapy of such disorders put pressure to acquire new techniques aimed at improving the condition o children suffering from this disorders. This of course creates a friendly environment for spreading methods, which have nothing in common with science, yet which become popular to learn and use because of good marketing strategies and pseudo-scientific language" (Grabowska 2006).

Involvement of senses and the importance of movement in the process of learning have practical implications. This subject has been mentioned in studies by M. Montessory or O. Decroly. The role of movement in emotional and social development is also an important part of studies of W. Shenborne (Developmental Movement Method) and M. Bogdanowicz (Good Start method). Neuropsychologists and neurophysiologists have also studied learning through movement.

The relationship of movement and learning and its significance for academic skills have been the subject of studies for nearly forty years (Kephart 1975, Maas 1998). Recently they have been especially appreciated.

Lately, researches aimed at new and effective methods of stimulation and therapy have been limited to methods, which affect mechanisms of individual's sensorimotor development. These methods either stimulate a chosen part of sensory modality, e.g. hearing (such as Sound Symbol Method by B. Kaja or exercises according to A.A. Tomatis, K. Johansen or The Listening Program by ABT) or the stimulate many senses (e.g. Good Start Method by M. Bogdanowicz, F. Warnke's method or computer programme Fast For Word by Scientific Learning). There are also programmes which concentrate primarily on movement. These include *inter alia* W. Shenborne's Developmental Movement, Sensory Integration by J. Ayers, psychomotorics according to M. Procus and M. Block, INPP programme by S. Goddard-Blythe and P. Blythe, Interactive Metronome which originally supported motor rehabilitation or finally programme which is the subject of this presentation – Move to Learn Programme.

B. Pheloung's Move to Learn Programme belongs, just like methods mentioned above, to the therapies using movement. According to it perception and formation of motor skills underlie the development of a human being. Each of them has their own characteristics though. Some programmes are complex (you can separate diagnostic, therapeutic and evaluative part), specialised (conducted by certified therapists), mostly for individuals (one-to-one), like Sensory Integration or INPP by Sally Goddard. Other, like presented here Move to Learn Programme are destined for schools, to be used in groups and do not require initial diagnosis of the reflexes. Therefore it can be used as a perfect supplement of educational classes or as a part of a general process of child's development stimulation. Learning about such perceptual-motor programme as Move to Learn may enable us to effectively support children's development at school or it can play a supportive role, e.g. when a child is waiting for the opportunity to take part in a therapy e.g.

according to one of the mentioned above methods or even when the child is participating such therapy as its reinforcement.

Especially regarding children with learning difficulties, it is normal to try to undertake multispecialised actions. A case when one child, who e.g. has problems with speech development is taken care by a few experts is well known: teacher of a given school stage, who takes care of the corrective-equalizing classes, teacher-therapist, who takes care of the corrective-compensatory classes and teacher-speech therapist, who takes care of child's speech and language classes. However, it may be often noticed that the cause of all these disorders lies within the motor impairment, e.g. not sufficient general motor fitness and/or low motor fitness concerning the speech organ, but also incorrect planning and organisation of palms movement and fingers when performing manual (e.g. modelling, cutting out) and graphomotor (writing) activities etc.

The author of the Move to Learn Programme tries to draw closer attention to this fact. She stresses that without solid basis the top will shake or will fall down (Pheloung, 2006). She also says that a multispecialised type of work with a person will never be effective without previous reduction of motor difficulties. What is more, it can turn out to even be harmful with certain children, as the number of experts taking care of a child is accompanied by an increasing feeling of their problems. Yet, basing on movement and working with a body, it is possible to change the whole image of a child without the necessity to make many specialised efforts and often to bear high costs.

An example of the author's view is well presented in her "Pyramid of Learning". It is an outline presenting (in a simplified way so that it could be understood by every parent or teacher) the importance of learning before starting school education of a child. It illustrates the author's views. Initially, B. Pheloung used ladder outlines, where reaching certain skills was supposed to resemble climbing steps of a ladder. However, the will to show the great importance of basic, fundamental skills for learning, made her change her outline to a pyramid, the basis of which are the biggest, most important "blocks". This is how "Pyramid of Learning" was created.

Various levels of "Pyramid of Learning" correspond to different characteristics of individual's functioning or skills acquired by individual in the process of development. "Arousal Level" is the basis on the pyramid. It is connected with the fact that our development depends to huge extent on the dynamics of nervous processes (neurodynamics), their strength, balance and mobility. B. Pheloung reminds us that any disorders at this level will most probably cause child's difficulties with maintaining an appropriate level of activity (the child will be too inhibited or too aroused, will be unable to properly concentrate their attention and memorise things). Optimal level of activity co-decides about receiving stimuli coming from the external world. Correctly developing child is able to receive stimuli through vision, hearing, skin, muscles, balance organ.

Second level of the pyramid called „Message from the World to the Brain" corresponds to this ability.

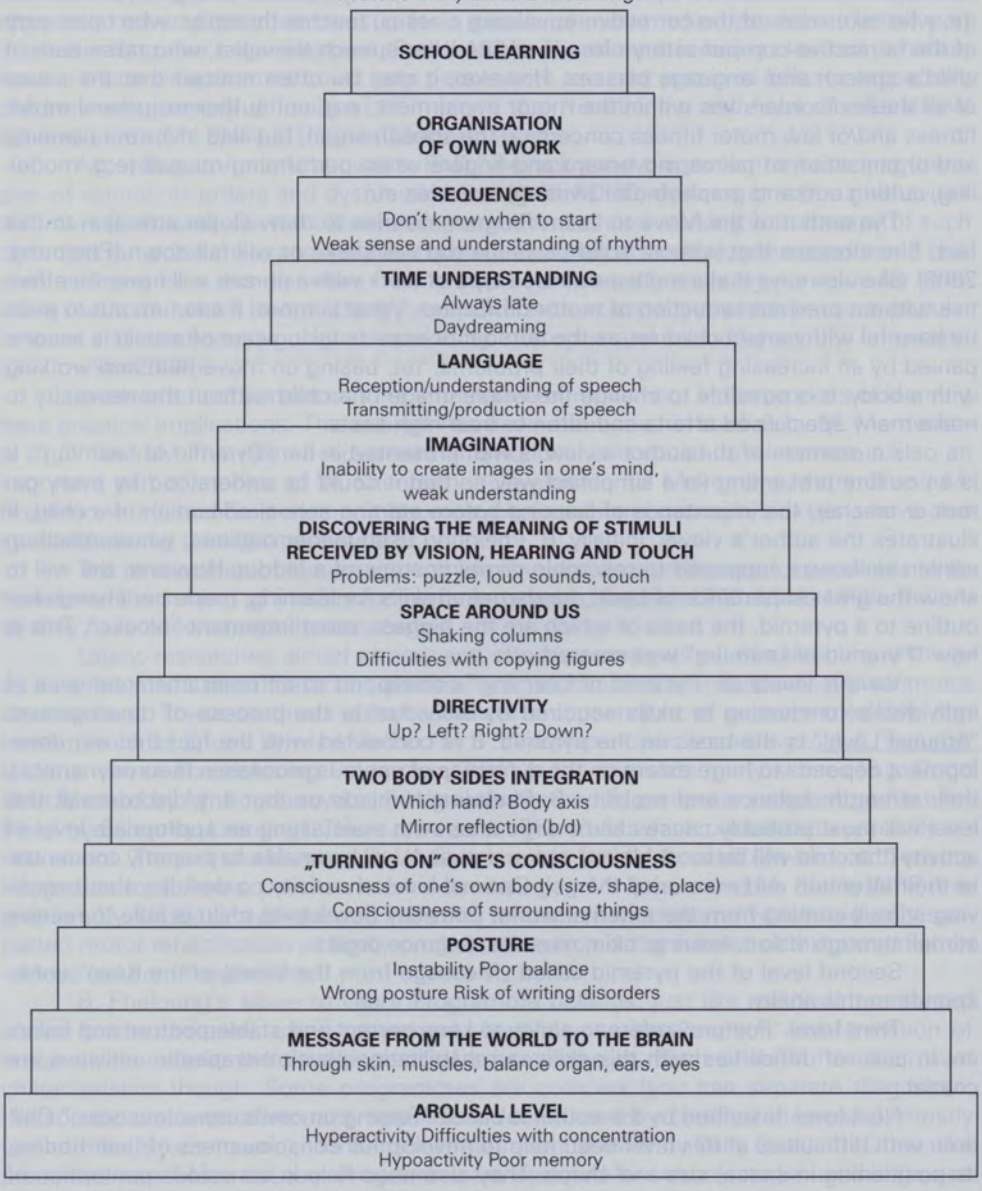
Third level "Posture" refers to ability to keep correct and stable posture and balance. In case of difficulties with this skills, a rehabilitation-physiotherapeutic activities are crucial.

Next level described by the author is called "Turning on one's consciousness." Children with difficulties at this level need help to develop full consciousness of their bodies, its positioning in space, size and shape. They also need help in conscious perception of objects around them.

Fifth level – "Two Body Sides Integration" reflects the ability of a child to automatically call right and left body sides and to correctly recognise inverted shapes. A child with difficulties at this level may have problems with recognising sides of their own body, poor concentration or inability to do more than one thing at a time.

Next, sixth, level contains directional orientation in space, i.e. the ability to recognise and point directions: right, left, up, down, as well as time reference ("before", "after"). This level is called "Directivity".

Picture 1: *Pyramid of Learning*



Source: B. Pheloung (1997). Help your class to learn.
Effective perceptual movement programs for your classroom, Griffin Press, 27.

In the middle of the pyramid, B. Pheloung placed a level corresponding to our orientation in space and called it "Space Around Us". A child with poor consciousness of

their own body's location/orientation in space may have similar difficulties when it comes to placing their drawings or signs on paper or copying figures. A characteristic syndrome of this difficulties is drawing a straight line as slanting ("shaking columns").

Next level – "Discovering the Meaning of Stimuli Received by Vision, Hearing and Touch" refers to the way in which an individual interprets what they see, hear, feel. Children whose development in this area is impaired may have problems with arranging, may feel disturbed with loud sounds or may not listen, they may also hate touch or may ask to be touched.

On the ninth level – "Imagination" – the author emphasises the role of a neuropsychological process, which allows to create objects', scenes' or phenomena's images when these are absent (recreated images) or to create images of unreal objects, scenes or phenomena (creative images) (Zdankiewicz-Ścigała, Maruszewski 2006).

Syndromes of difficulties on this level may include problems with imagining objects, scenes or phenomena, but also problems with understanding and creating written statements.

"Language" is the tenth level of the pyramid. Disorders on this level, take basically two forms: difficulties with understanding (child repeats a question many times to make sure, e.g. "What?", asks to repeat what has been said) and/or difficulties with linguistic expression (child encounters great difficulties when creating statements, speaking).

On level eleven of the pyramid, the author focuses on understanding the notion of time. This level is called "Time Understanding" and it pays attention to the fact that children with time understanding disorder keep on being late and have problems with proper planning next activities in time.

Twelfth level – "Sequences" – corresponds to the sense of rhythm, ability to create written statements and learning in group. Children with difficulties on this level have problems with sentences structures, but also require a one-to-one teaching mode.

Thirteenth level of the "Pyramid of Learning" is "Organisation". Difficulties on this level mean generally that the child have problems with organisation in a situation of school method learning (Pheloung 1997).

Regarding children with learning difficulties connected with the last, fourteenth level of the pyramid (its peak), Pheloung suggests perceptive motor programmes. She also recommends stopping corrective and compensatory classic exercises for at least 6 months devoted to such programme. She justifies it with her concern about the child, so that the child, who is not prepared to learn in a school-like manner would not find a confirmation of their weakness. This weakness is an outcome of disorders on lower levels, which correspond to elementary skills, which should be acquired before starting school.

Regarding work with children who started going to school without reaching the appropriate level of maturity, B. Pheloung proposes exercises according to her perceptual motor programme Move to Learn. This is a relatively cheap method (currently, the costs of a bank transfer from Poland to Australia, where you can order required materials, are higher than the costs of the sole materials), which does not require highly specialised trainings. As proved in Australian and Polish studies, the programme Move to Learn may help improving the functioning of an individual in specified fields by itself or before such an individual starts a specialised classes, which often require special equipment.

As it has been indicated in the title of one of the books by B. Pheloung ("School floors..."), Move to Learn exercises require only a school floor – a safe surface on which the children could roll, creep, crawl on all fours, etc.

Almost every teacher or an expert employed by the school can conduct the classes. Preparations of the leader comprises of familiarising oneself with methodical materials and watching a DVD film carefully, where you can see *inter alia* all movements sequences in accordance with the programme.

Move to Learn creates yet another chance for a child – it enables us to support the child in the environment in which they spend the greatest amount of time every day.

As the authors of childhood studies point out "modern childhood is clearly moving from domestic to school areas" (Smolińska-Theiss 2010, p. 24). School is where children spend more time than outside of it (additional courses, playgrounds, home) and even more than with their own parents. School functions include not only didactic role, but also educational, preventive, diagnostic and corrective-equalizing roles. Therefore, various programmes which support and stimulate child's development, including programmes supporting pupils with learning difficulties (like e.g. Move to Learn) belong without a doubt to the functions of a school. The question is whether it is possible to introduce such exercises on a formal and organisational level to Polish school. Checking this possibilities was one of the aims of my studies regarding Move to Learn programme in Poland.

Move to Learn programme consists of ten sequences of movements, which occur in early childhood in normal development. These include:

1. body consciousness,
2. rolling,
3. sliding on a belly (so called "cradle"),
4. one-sided creeping,
5. alternate creeping,
6. crawling,
   a. on one's belly,
   b. on one's back,
7. rocking,
8. one-sided crawling on all fours,
9. alternate crawling on all fours,
10. alternate walking.

The simplicity of this programme, not complicated way to learn how to work with the children according to its rules and the possibility to immediately use it in a group of children (without the necessity to bear high costs related to e.g. training or purchasing specialised equipment) make Move to Learn a very interesting programme for therapeutic practice, whereas its proven efficacy make it reliable (*inter alia* the programme's efficacy study conducted in 2005 by Christine Chapparo, Ph.D., from Sidney University, the author of the programme – Barbara Pheloung and Stacey la Greca. The efficacy of the Move to Learn method was also confirmed in studies by C.R. Fredericks, S.J. Kokot and S.Krog, who presented their results in *South African Journal for Research in Sport, Physical Education and Recreation* Vol. 28(1) 2006, p. 29-42; Move to Learn 2005 Research, available: http://www.movetolearn.com.au/articles.html 28-02-2009).

In 2008–2009 I supervised Polish studies devoted to the effects of the Move to Learn method, which were conducted at Maria Grzegorzewska Academy of Special Education. As part of study *Methods of Neurodevelopmental Retardation Therapy of Children in Pre-School and Early School Age* realised in Polish-British-Australian cooperation in December 2008, 23 experts were prepared to participation. This group included teachers of a integrated teaching programmes, psychologists, children instructors, teachers-therapists and speech therapists. For ten weeks, these people conducted everyday exercises according to Move to Learn programme with pre-school and early school children (5-8 y.o.). The studies lasted until June 2009.

Aims of the project I supervised:

1/ pilot project to study tools of teachers diagnosis, which are possible to use in Move to Learn programme with pre-school and early school children (developmental work),

2/ gaining new knowledge – pilot studies for efficacy of Move to Learn in Polish circumstances.

The studies were of a pilot character. They were to check the accuracy of the elaborated concept of studies, to give basis to improving studies procedure and to take up possible further studies over this matter. The method used in this study was a pedagogical experiment method. The study group initially comprised of 227 children. Eventually, complete documentation took 147 children into consideration [here: 80 children belonged to the experimental group (test – B) and 67 to comparative group (control group – K)]. 73 girls and 74 boys in the age range 5–8 were in total examined:

- 5 y.o. children, test group (5B): 9 girls and 11 boys;
- 5 y.o. children, control group (5K): 16 girls and 3 boys;
- 6 y.o. children, test group (6B): 6 girls and 13 boys;
- 6 y.o. children, control group (6K): 7 girls and 9 boys;
- 7 y.o. children, test group (7B): 10 girls and 11 boys;
- 7 y.o. children, control group (7K): 6 girls and 7 boys;
- 8 y.o. children, test group (8B): 10 girls and 10 boys;
- 8 y.o. children, control group (8K): 9 girls and 10 boys.

Similarly to Australian studies on programme's efficacy, following techniques were used: observation, interview, pedagogical test and creations' analysis. The study tools used were: observation questionnaire (by V. Steer), interview questionnaire (by A. Olechowska), writing from an presented model (by T. Staburzyńska and T. Śliwińska), draw a person test (by F.L. Goodenough and D. Harris), graphomotor skills evaluation (by B. Wilgocka-Okoń).

The studies started in December 2008 and lasted until June 2009, while exercises with children took place between February and June 2009. Children in both groups (test and control) were examined twice: at the beginning of the studies, before the Move to Learn programme, and after finishing the exercises with children according to Move to Learn method. In each kindergarten and school the exercises lasted for 10 weeks, during which each child:

- underwent observation twice (before starting the programme Move to Learn by the children from the test group and after it has been finished). The person observing the child was the teacher (regarding chosen characteristics of school functioning, e.g. entering and sustaining social contacts, organisation of child's own work, reading and writing skills, etc.). Basing on the observation results from before and after the programme, conclusions were drawn regarding possible changes that occurred in the past 10 weeks in considering school functioning;
- drew twice (before starting the programme Move to Learn by the children from the test group and after it has been finished) their own portrait (a person). Basing on the analysis of the images, conclusions were made regarding children's emotions, attitude towards oneself and the world;
- wrote twice (before starting the programme Move to Learn by the children from the test group and after it has been finished) a short text from listening. Basing on the results of both writing skills tests, conclusions were drawn regarding possible changes in this respect; children from 5 and 6 y.o. group copied figures (spiral, rhombus and frieze).

Additionally:

- children's parents completed interview questionnaires, filling in data concerning biopsychological (prenatal, near birth and after birth development), economic and social (economic and living conditions, educational and family atmosphere) as well as pedagogical (possible learning difficulties) aspects. It was done so in

order to check the similarities of the groups (test and control) regarding factors conditioning the development and learning of the examined children in order to better analyse obtained results;
- twice, persons conducting exercises with children (teachers, psychologists, children instructors and speech therapists) answered questions in an evaluative questionnaire regarding the preparations and implementation of the Move to Learn Programme in their institutions.

Studies results

The results of all the studies were put in the following categories: positive change (for better = level rise +1), negative change (for worse = level decrease -1) or lack of changes (no changes = 0).

Teacher's observations results

The analysis of teacher's observations shows that there is a statistically significant ($p>0.05$) difference regarding general school functioning between children participating in Move to Learn programme and children, who did not take part in it.

***Table 1**. Teachers' opinions regarding general school functioning of children from the test and control groups*

No.	Group / Changes	Test group		Control group	
		N	%	N	%
1.	Positive	14	17.50	9	13.43
2.	Negative	0	0.00	0	0.00
3.	No changes	66	82.50	58	86.57
4.	**Total**	80	100.00	67	100.00

Source: own studies

***Table 2.** Results of statistical analysis of the Chi-squared test of the significance level of differences in teachers' descriptions regarding general school functioning of children from the test and control groups*

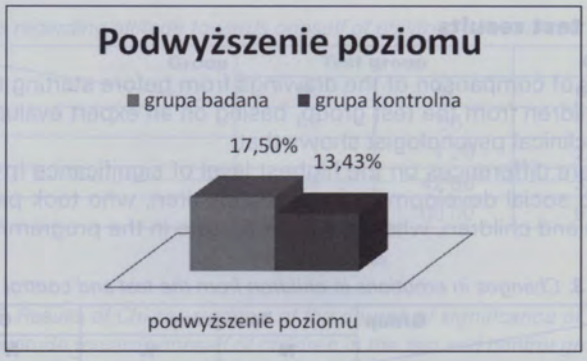
Statistics	Value	df	Asymptotic significance (two-tailed)	Exact significance (two-tailed)	Exact significance (single-tailed)
Pearson Chi-squared	.457[a]	1	.499	-	-
Continuity correction[b]	.201	1	.654	-	-
Likelihood ratio	.461	1	.497	-	-
Exact Fisher test	-	-	-	.649	.329
Correlation test	.454	1	.500	-	-
N of significant observations	147	-	-	-	-

a. .0% of cells (0) has an expected frequency lower than 5. The minimal expected frequency was 10.48.

b. Calculated only for the 2x2 table.

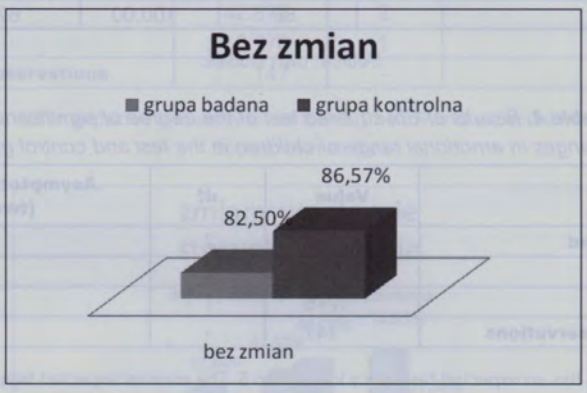
Source: own studies

Graphs 1, 2 and 3 present percentage balance of teachers' opinion's analysis results regarding changes in general school functioning of children from test and control groups.



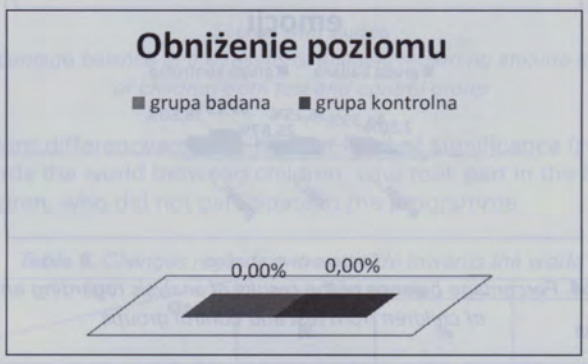
Source: own studies

Graph 1. *Comparison of the scale of positive changes regarding general school functioning of children from the test and control group*



Source: own studies

Graph 2. *Comparison of the scale of lack of changes regarding general school functioning of children from the test and control group*



Source: own studies

Graph 3. *Comparison of the scale of positive changes regarding general school functioning of children from the test and control group*

Draw-a-person test results

An analysis of comparison of the drawings from before starting the Move to Learn programme by children from the test group, basing on an expert evaluation of these drawings made by a clinical psychologist shows that:

a/ there were differences on the highest level of significance ($p<0.001$) regarding the emotional and social development between children, who took part in the Move to Learn programme and children, who did not participate in the programme.

Table 3. *Changes in emotions in children from the test and control group*

No.	Group / Changes	Test group		Control group	
		N	%	N	%
1.	Positive	49	61.25	26	38.80
2.	Negative	2	2.50	23	34.33
3.	No changes	29	36.25	18	26.87
4.	**Total**	80	100.00	67	100.00

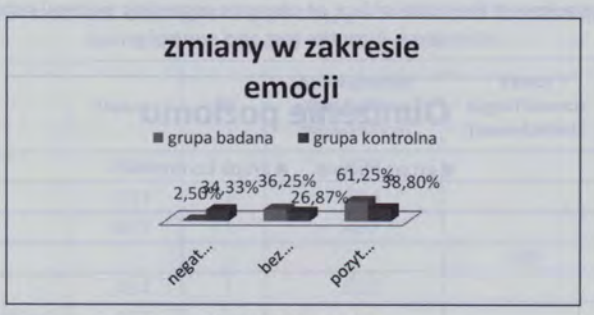
Source: own studies

Table 4. *Results of Chi-squared test of the degree of significance of changes in emotional range of children in the test and control groups*

Statistics	Value	df	Asymptotic significance (two-tailed)
Pearson Chi-squared	26.324[a]	2	.000
Likelihood ratio	29.334	2	.000
Correlation test	.778	1	.378
N of significant observations	147	-	-

a. .0% of cells (0) has an expected frequency lower than 5. The minimal expected frequency was 11.39.

Source: own studies



Source: own studies

Graph 4. *Percentage balance of the results of analysis regarding emotions of children from test and control groups*

b/ there were differences on the highest level of significance ($p<0.001$) regarding the attitude towards oneself between children, who took part in the Move to Learn programme and children, who did not participate in the programme.

Table 4. Changes regarding attitude towards oneself of children from the test and control group

No.	Changes / Group	Test group		Control group	
		N	%	N	%
1.	Positive	45	56,.	12	17.91
2.	Negative	1	1.25	22	32.84
3.	No changes	34	42.50	33	49.25
4.	**Total**	80	100.00	67	100.00

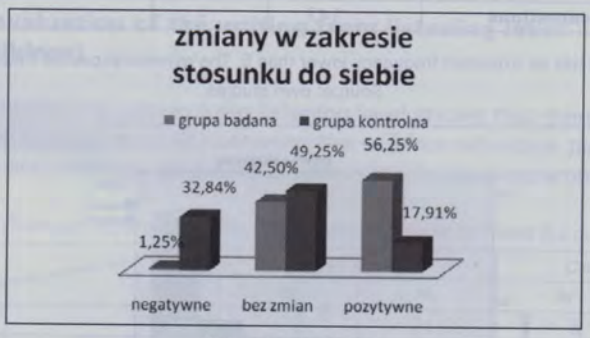
Source: own studies

Table 5. Results of Chi-squared test of the degree of significance of changes in attitude towards oneself of children in the test and control groups

Statistics	Value	df	Asymptotic significance (two-tailed)
Pearson Chi-squared	37.437[a]	2	.000
Likelihood ratio	42.870	2	.000
Correlation test	8.778	1	.003
N of significant observations	147	-	-

a. .0% of cells (0) has an expected frequency lower than 5. The minimal expected frequency was 10.48.

Source: own studies



Source: own studies

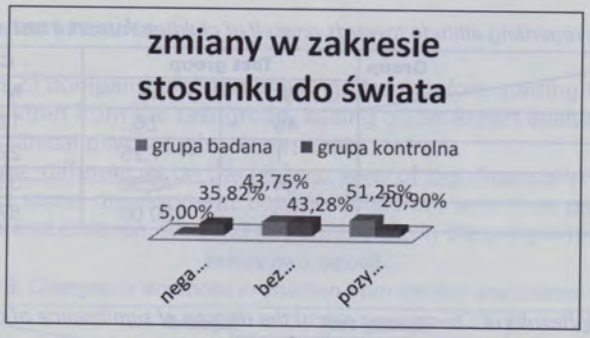
***Graph 5.** Percentage balance of the results of analysis regarding attitude towards oneself of children from test and control group*

c/ there were differences on the highest level of significance ($p<0.001$) regarding the attitude towards the world between children, who took part in the Move to Learn programme and children, who did not participate in the programme.

Table 6. Changes regarding the attitude towards the world

No.	Changes / Group	Test group		Control group	
		N	%	N	%
1.	Positive	41	51.25	14	20.90
2.	Negative	4	5.00	24	35.82
3.	No changes	35	43.75	29	43.28
4.	**Total**	80	100.00	67	100.00

Source: own studies



Source: own studies

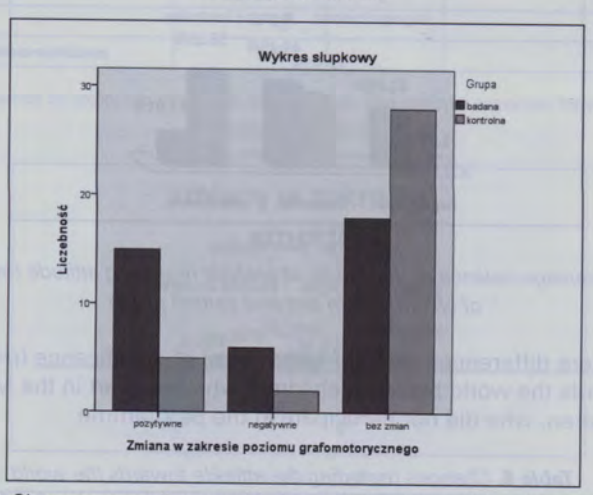
Graph 6. *Percentage balance of the results of analysis regarding attitude towards the world of children from test and control group*

Table 7. *Results of Chi-squared test*

Statistics	Value	df	Asymptotic significance (two-tailed)
Pearson Chi-squared	27.166[a]	2	.000
Likelihood ratio	29.108	2	.000
Correlation test	4.015	1	.045
N of significant observations	147	-	-

a. .0% of cells (0) has an expected frequency lower than 5. The minimal expected frequency was 12.76.

Source: own studies



Graph 7. *Changes regarding graphic level of drawings of 5 and 6 y.o. children*

Results of the evaluation of the graphic level of drawings (children 5 and 6 y.o.)

The evaluation of the graphic level of drawings shows that there were statistically significant differences ($p>0.01$) regarding the graphic level of drawings of 5 and 6 y.o. children, between the children who took part in the Move to Learn programme and children, who did not participate in the programme.

Table 8. Changes regarding graphic level of drawings of 5 and 6 y.o. children (drawing from a presented model)

No.	Group / Changes	Test group		Control group	
		N	%	N	%
1.	Positive – 1	15	38.46	5	14.29
2.	Negative – 2	6	15.38	2	5.71
3.	No changes – 3	18	46.16	28	80.00
4.	**Total**	39	100.00	35	100.00

Source: own studies

Table 9. Results of Chi-squared test

Statistics	Value	df	Asymptotic significance (two--tailed)
Pearson Chi-squared	8.984[a]	2	.011
Likelihood ratio	9.301	2	.010
Correlation test	7.972	1	.005
N of significant observations	74	-	-

a. .33,3% of cells (2) has an expected frequency lower than 5. The minimal expected frequency was 3.78.

Source: own studies

Results of the evaluation of the writing from listening level (7 and 8 y.o. children)

The evaluation of the writing from listening level shows that there were no statistically significant differences ($p>0.05$) between the children who took part in the Move to Learn programme and children, who did not participate in the programme.

Table 10. Changes regarding writing from listening skills of 7 and 8 y.o. children

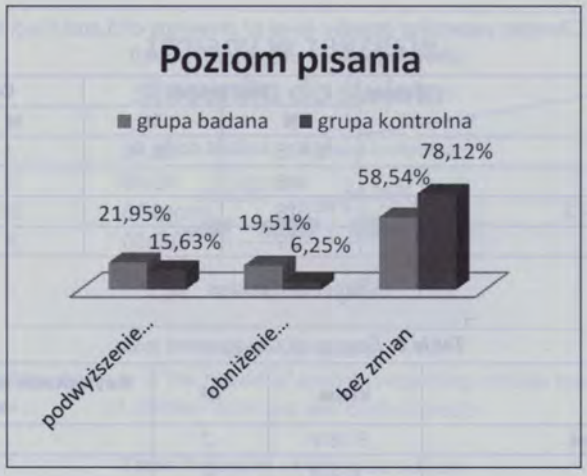
No.	Group / Changes	Test group		Control group	
		N	%	N	%
1.	Positive	9	21.95	5	15.63
2.	Negative	8	19.51	2	6.25
3.	No changes	24	58.54	25	78.12
4.	**Total**	41	100.00	32	100.00

Source: own studies

Table 11. Results of Chi-squared test

	Value	df	Asymptotic significance (two-tailed)
Pearson Chi-squared	3.710[a]	2	.156
Likelihood ratio	3.922	2	.141
Correlation test	1.880	1	.170
N of significant observations	73	-	-

a. 16.7% of cells (1) has an expected frequency lower than 5. The minimal expected frequency was 4.38.



Source: own studies

Graph 8. *Percentage balance of the results of analysis regarding writing from listening of children from test and control group*

Interview results

Comparison of the interview results allowed us to check the level of similarity between the groups of children (test and control) regarding biopsychological, economic and social, as well as pedagogical groups of variables (development and learning factors). It was expected that all three groups would show statistically significant convergence. However, two out of three groups of variables showed convergence (socio-economic and didactic factors). Statistically significant difference was proven in reference to biopsychological conditions determining development and learning of children from test and control group. It must be noted that in the test group (in which generally greater amount of positive changes was observed) significantly more children (in comparison to the control group) had disadvantageous biopsychological conditions for development and learning.

This must be taken into account when analysing the obtained results, as well as when planning further studies on this subject. It can mean that for children from test group it was more difficult to reach positive changes regarding the tested variables (general school functioning, level of writing from listening or emotional development), but despite this – the results from this group are generally better.

Table 12. *Chosen factors determining the development of the examined children*

INTERVIEW RESULTS							
No.	Group	Biopsychological factors		Socio-economic factors		Didactic factors	
		advantageous	disadvantageous	advantageous	disadvantageous	advantageous	disadvantageous
1.	B 80	70.00%	30.00%	91.25%	8.75%	87.50%	12.50%
2.	K 67	83.58%	16.42%	97.01%	2.99%	89.55%	10.45%

Source: own studies

Table 13. Results of Chi-squared test – biopsychological factors

Statistics	Value	df	Asymptotic significance (two-tailed)	Exact significance (two-tailed)	Exact significance (single-tailed)
Pearson Chi-squared	3.708[a]	1	.054	-	-
Continuity correction[b]	2.997	1	.083	-	-
Likelihood ratio	3.795	1	.051	-	-
Exact Fisher test		-	-	.079	.041
Correlation test	3.683	1	.055	-	-
N of significant observations	147	-	-	-	-

a. .0% of cells (0) has an expected frequency lower than 5. The minimal expected frequency was 15.95

b. Calculated only for the 2x2 table.

Source: own studies

Table 14. Results of Chi-squared test – socio-economic factors

Statistics	Value	df	Asymptotic significance (two-tailed)	Exact significance (two-tailed)	Exact significance (single-tailed)
Pearson Chi-squared	2.108[a]	1	.146	-	-
Continuity correction[b]	1.225	1	.268	-	-
Likelihood ratio	2.255	1	.133	-	-
Exact Fisher test				.182	.134
Correlation test	2.094	1	.148	-	-
N of significant observations	147	-	-	-	-

a. 50.0% of cells (2) has an expected frequency lower than 5. The minimal expected frequency was 4.10.

b. Calculated only for the 2 x 2 table.

Source: own studies

Table 15. Results of Chi-squared test – didactic factors

Statistics	Value	df	Asymptotic significance (two-tailed)	Exact significance (two-tailed)	Exact significance (single-tailed)
Pearson Chi-squared	.150[a]	1	.698	-	-
Continuity correction[b]	.017	1	.898	-	-
Likelihood ratio	.151	1	.698	-	-
Exact Fisher test	-	-	-	.799	.451
Correlation test	.149	1	.699	-	-
N of significant observations	147	-	-	-	-

a. .0% of cells (0) has an expected frequency lower than 5. The minimal expected frequency was 7.75.

b. Calculated only for the 2 x 2 table.

Source: own studies

Evaluative questionnaire results

During the ten weeks of exercises, people implementing the Move to Learn programme had to fill in evaluative questionnaires twice – in the middle and at the end of the programme.

First questionnaire contained 17 questions. They concerned number of people

conducting exercises in each institution, number and age of children participating in the programme and number and age of children in the comparison group, course of the first stage of implementation of the program in the institution, attitude of the person conducting the exercises before its realisation and after a few weeks of having exercises with the children. I was also interested in the opinion of people conducting exercises regarding the level of difficulty and their efficiency and whether they had noticed any changes in children participating in the programme. If yes, then what kind of changes.

Second questionnaire contained 18 questions and concerned the stage (motor sequence) on which the children finished the programme after 10 weeks as well as general observations of the people conducting the exercises regarding children's attitude to the exercises and possible difficulties with doing the exercises.

Analysis of all the responses given by people conducting exercises in both questionnaires allowed me to formulate following conclusions:

- 14.29% conducted the exercises by themselves, while the remaining 85.71% did it together with other teachers or form masters.
- 28.57% of people conducting the exercises were simultaneously teachers-form masters of the children they had exercises with according to the programme, or teachers-therapists or teachers-speech therapists, while 14.29% were teachers--psychologists.
- On the implementation level, each person conducting exercises according to the programme in each institution had preparatory talks with the following persons:
    a. headmasters,
    b. teachers of the children participating in the exercises,
    c. teachers of the children in the comparison group,
    d. parents of the children participating in the exercises,
    e. parents of the children in the comparison group.

What is more, almost half of the people (42.86%) conducting the exercises talked about the programme with other people in a given institution, where the programme was held, such as:

- other teachers form a given institution,
- school psychologist and children instructor,
- their superiors in work places other than the one, where the exercises took place.

100% respondents said that the talks they had with headmasters of the institutions were easy, held in good atmosphere and the headmasters had no additional questions after they listened to the presentation of the MtL programme delivered by the person conducting the exercises. 71% of talks lasted less than 30 minutes (the remaining 29% took longer than 30 minutes).

Similarly, the respondents said that the talks with teachers-form masters of the children who were about to participate in the MtL programme (test group) were also easy in 100% of cases. Less respondents (42.86%) replied that the time of a talk with a teacher--for master of the children who were supposed to participate in exercises was short, while the remaining 57.14% said that their conversation took longer than 30 minutes. All conversations were held in a friendly atmosphere. Just like school headmasters, teachers--forms master did not have any additional questions for the people presenting the Move to Learn programme.

100% of talks with teachers-form masters of children who were about to be included in the comparison group were described as easy, were held in a nice atmosphere and did not last longer than 30 minutes. Only 14.29% of teachers-form masters of children from the comparison group had additional questions to the person presenting the programme, justifying it with a will to better know the programme in order to be able to answer parents' and children's question reliably.

85.71% respondents declared that talks with the parents of the children who were about to be included in the test group were also trouble free for the persons presenting the MtL programme. Some respondents (14.29%) described their talks with parents of the children from the proposed test group as difficult. Exactly half (50%) of the talks lasted less than 30 minutes, while the other half (50%) were longer than 30 minutes. All conversations were held in a friendly atmosphere. Most parents had additional questions. In 71% of talks, parents asked the person presenting the MtL programme, why their children were chosen to participate in the exercises in the experimental group, what various reflexes look like, what various exercises look like and how long will they last, is there any danger connected with the exercises and what effects they should bring. However, the greatest number of reservations raised by parents concerned not the programme, but the interview, which they did not like as it contained too personal (in the opinion of the parents) questions (*inter alia* about the pregnancy, birth and economic conditions of the family).

Interviews with parents of children from the comparison group were also described as short in most cases (71.43%) and held in a nice atmosphere (100%). Most respondents described them as easy (85.71%), however there were people who found the conversation difficult (14.29%). These parents also had many questions, especially regarding filling in the interview questionnaire. Some parents (in accordance with their rights) did not give permission for their children to participate in the programme. In such cases the results of child's diagnosis were not taken into account in the analysis. What is more, the parents asked for the justification as to why their children were chosen to be included in the comparison group.

Some of the respondents (42.86%) held talks with other people in the institutions where the Move to Learn programme was supposed to be implemented. These talks were described as easy, short and held in nice atmosphere (67% each). 30% of interlocutors asked about the details of the programme, e.g. successive motor sequences. Moreover, in case of one person conducting the exercises, his/her superior in an institution different that the one where the exercises were supposed to take place, asked for the programme to be included in the basic offer of the first working place of this person conducting exercises with children.

Preliminary diagnosis of the children from both test groups (experimental and comparison) lasted 1–3 weeks. It can be assumed that the number of diagnosed children did not influence significantly the time of the diagnosis. It turned out that persons who had to diagnose most children (50) did it faster (in two weeks) than persons who had less children (11) to diagnose, who finished their diagnosis later (in 3 weeks). The final diagnosis took 2 weeks at most. Shorter time of the final diagnosis is connected to the fact that this time there was no need to hold interviews with the parents, which (as we know) took the greatest amount of time and which (as it was later revealed) was the most problematic aspect. Some of the respondents noticed that the final studies were easier as they already had greater experience with the methods and tools gained in the first stage of studies. There were also no difficulties with final diagnosis reported.

More than half of the respondents (57.14%) had no additional remarks or suggestions concerning the conduction of the preliminary diagnosis; the remaining respondents (42.86%) once again paid attention to the difficulties they faced when the parents were filling in the questionnaire (*Parents from the experimental group filled in the questionnaires very quickly, parents from the comparison group did not want to fill in the questionnaires, it required additional meeting and even then some of them did not give consent. Difficulties with arranging the individual meeting in order to fill in the questionnaire*). Moreover, the long time of diagnosis was explained by a high percentage of absent children (the studies began in February).

Slightly more than half of the respondents (57.14%) did not report any difficulties during the preliminary diagnosis, while the remaining people (42.86%) reported further problems concerning filling in the questionnaire by the parents of the children participating in the study, including some violent reactions of the parents (*threatening with the Protection of the Personal Data Department*), questions in the questionnaire regarded as too private, lack of will of the parents to fill in the questionnaire and many refusals; another significant difficulty was the time the studies were started – February, when many pupils and teachers were absent, which very often prolonged the time of the diagnosis

One of the questions in the questionnaire (where the respondents were supposed to finish a sentence) was about the feelings and expectations of the person conducting the programme before the beginning of exercises and after a few weeks of the programme.

The responses of 67% of respondents show that the programme was a pleasant, positive surprise (they learnt with satisfaction that their expectations were less positive than what the reality later brought), the remaining 33% drew negative conclusions from the confrontation of the theory (assumptions, expectations) with practice (implementation of the programme). It is worth noting that no one has foreseen the reaction of the children they were about to work with in a correct way. Respondents were divided into two groups: one group assumed that the children will be willing to do the exercises (and they were unpleasantly disappointed), while the other group feared that the children will not want to participate in the programme and will become bored quickly (and they were positively surprised). Table 14 contains exemplary answers given by the respondents.

Table 14. *Exemplary answers of the respondents on their attitude before the realisation of the MtL programme and after half of the programme was realised*

OPEN STATEMENTS	
Before starting exercises in accordance with the Move to Learn programme, I thought that	**and now I can state that**
POSITIVE	
... the kids will sometimes react negatively to me as a person entering the class, disrupting the lesson and forcing them to do monotonous exercises	*...the kids welcome me with enthusiasm, ask after me, the exercises are still interesting for them.*
...running these exercises will be more difficult...	*...it is doable, the exercises are liked by the children.*
...the children will be unwilling to do the exercises, they will find them funny...	*... children are doing the exercises very willingly. They know the warm-up sequence so well that they sometimes "correct me" when I forget or skip over something.*
... the exercises will be seen as laughable, I was afraid that the children will not be willing to do them, I wondered how the organisational side of the exercises would look like...	*...kids do the exercises willingly, ask which exercise will come next, try to do them as well as they can.*
NEGATIVE	
...the children would do the exercise more willingly...	*... they find them more difficult and do them not too willingly.*
... preliminary diagnosis would be made effectively and without any problems...	*... it was not that easy.*

Source: own studies

Most of the children in the test group were happy (57.14%) or very happy (42.86%) to do the exercises. There were however individual children in the groups, who didn't want

to do the exercises [*some children find the exercises difficult, they get angry easily and stop trying, other children, who are not very hygienic, they e.g. have feet legs or socks, do not want to do the exercises very often as they do not feel comfortable (surprisingly, this is a huge problem and talks with parents do not help)*]. The final questionnaire showed that 67.00% of children were happy to do the exercises, while 33.00% were very happy to do so. It is clear that the number of children who were very happy to do the exercises decreased, yet the statistical significance of this change was not the subject of a study.

After 10 weeks, one third (30.00%) of the people conducting the exercises fully completed the programme. This means that all the children learnt all the motor sequences. In most cases (70.00%) children finished the exercises with alternate crawling on all fours. This can be fully justified by the fact that children learn various motor sequences at different speed and you cannot move to another stage until all the children are able to perform exercises correctly. Thus the fact that not all the children completed the programme resulted mostly from the differences between children themselves, their level of development and range and difficulty of demands at school.

In terms of the place, where the exercises were conducted for the whole group in an institution: according to slightly above half of the respondents *there was enough room* (57.14% of respondents chose this answer), *little, but there was room for all children* (28.57%) or *too little, I had to divide the children into groups* (two groups at the most) (14.29%).

From amongst the exercises the children mastered before the questionnaire was made, the most popular one was rolling (60.00%). Other popular exercises included: "Sunflower", one-sided crawling on all fours, alternate crawling on all fours and rocking (10.00% each). Least popular exercises were: one-sided creeping, alternate creeping, sliding on a belly and "Fish" (25.00% each). Analysis of the answers given by the persons conducting the exercises in the final questionnaire (after the programme was completed) showed that permanently most popular exercises amongst the children were rolling (100%), creeping and alternate crawling on all fours, especially in pairs. What is interesting, not very popular previously exercise of creeping become one of the more popular ones.

Respondents listed various difficulties in doing the exercises by the children, most frequently they pointed to children's problems with eye movements without moving one's head (23.02%), but also problems with keeping a straight line of movement when rolling and problems with exercises requiring alternate movement of limbs (alternate exercises), moreover 7.83% respondents mentioned difficulties with orientation in one's body schema, getting up from lying position, too fast speed of doing exercises by some children, dizziness and nausea while rolling and a proper way of keeping one's thumb (opposable to the rest of the fingers). Same answers were given in the final questionnaire.

During 5 weeks of doing exercises according to the Move to Learn programme, all the persons conducting the exercises noticed some changes in the way various children were doing exercises. Above all, they pointed out to greater precision in doing exercises, what is more the consciousness of one's body became greater together with self-control and concentration. Dizziness and nausea during rolling disappeared. It was also noted that children were doing exercises slower, more carefully, more fluently, easier. Some respondents said that with the progress of the programme the children started to better "understand" their own bodies.

Here follows a selection of some of the observations and experiences gathered at the midpoint of the Move to Learn programme:

The method is an interesting alternative for a traditional physical education lessons and a good idea for the midday recess (as there is a big rug in the classroom), however I have not observed any significant improvement in teaching and learning.

The children greet the trainer enthusiastically, like the exercises, treat them as an everyday, pleasant activity.

During the warm-up, when the nervous system is being quieted down, it is beneficial to play some relaxation music in the background; the children are more partial toward named exercises e.g. when sliding on a belly is called "a seal", one-sided creeping is "a crocodile", etc.

I noticed an observable change in class behaviour of some of the children who, previously, had problems with sustaining proper posture while writing or who suffered from motor restlessness. I felt that they became silenced and that they were able to control their bodies. Apart all that all children exhibit greater focus during the class.

The exercises help less dexterous children to open up, know their bodies better, encourage systematic work and listening to instructions given to the class.

There was not a single negative statement concerning the experiences with the programme.

After the programme was over, experiences and observations were gathered again and have proven mostly similar, consisting of statements like the ones provided below.

The children participated in the exercises willingly, wanted to do them in the following school year. A certain bond was developed; at the beginning of the exercises the children sat close to me. They also kept track of all the elements of the warm-up, and pointed out if I missed any. The children started to be conscious of the space around them – they were more aware of other pupils, did not knock each other down, tried not to bump into each other. They monitored each other, were helpful when any "irregularities" were found.

During the final stages of the programme the children executed the exercises with increasing precision and involvement. They remembered the sequence of warm-up exercises and corrected me from time to time. They had their favourite exercises and asked to repeat them (e.g. rolling). The children find the exercises highly interesting but taking into consideration the classroom conditions, their realization is somewhat difficult due to: number of pupils, classroom size, the need to realize the teaching programmes.

The children were keen on doing the subsequent exercises. At the end they were able to perform the warm-up exercises by themselves, remembering even their sequence. The warm-up exercises were performed with high precision, some of them with increasing involvement. A few kids were bored with the routine character of the warm-up but still tried to do them precisely. They were enthusiastic to know the next exercises (what will the new week bring). They asked to repeat their favourite ones (rolling).

I observed that the class was generally calmed down Turing classroom activities - that their focus was improved. Children who previously had problems with sitting at their desks exhibited better endurance, focus, increased ability to sit in one position, they stopped "moving around".

I had two pupils who had big problems with remaining properly seated, exhibited symptoms of hyperactivity, whose desks were messy and who had much problems in focusing their attention, whose letters were not of expected shape. After the programme was over, and even during its realization, I observed significant improvements in their handwriting skills. The boys were able to focus on the task at hand and were able to sit still for a longer period without exhibiting any symptoms of hyperactivity,

After speaking with the class teacher, I know that concentration and ability to properly sit at the desk have increased significantly in case of some children. From my own perspective, I observed a great improvement in the manner the class exercises are performed.

The analysis of all the information given by the people conducting exercises according to the Move to Learn programme in both questionnaires shows that the exercises included in the Move to Learn Programme constitute an interesting set of perceptual motor exercises, which can benefit child's general development. Especially my studies on the MtL programme proved that even after 10 weeks of systematic exercises, we can see significant changes for better regarding the emotional and social development, but also

other benefits regarding the graphic level or the general pre-school and school functioning of the children.

The analysis of the answers given by the respondents allowed us to gather data, which will help us in the future plan more precisely proper studies regarding the efficiency of the programme when working with pre-school and early school children.

Summary and conclusions

The assumptions underlying conducting the studies in Poland were to check the accuracy of the tools and exercises procedure according to this method in the conditions of an ordinary Polish school (with a given infrastructure and number of children in groups) from the point of view possible further (proper) studies aimed at checking the efficacy of the Move to Learn exercises used with Polish pre-school and early school children.

10 weeks is definitely too short to be able to determine whether there has been significant and permanent changes especially concerning neuropsychological processes and such complex skills as reading, writing and counting. However, it is worth to take a look at the results of the pilot study.

To sum up the results of the studies it should be noted that the results in various groups showed that doing exercises according to the Move to Learn programme by children in the test group has influenced in a slight way their better results regarding general school functioning, significantly not much higher than it was in case of the children from the control group.

However, the children from the test group (who participated in the motor exercises) benefited massively from the exercises if we take into consideration the changes that occurred in their emotional and social development.

In all three examined groups ("Emotions", "Attitude towards oneself", "Attitude towards the world") the children participating in the Move to Learn programme had results significantly statistically better than the children from the control group (not participating in the MtL programme). It is of greatest importance that the differences are of the highest level of significance ($p<0.001$).

Therefore, regarding the pilot study, it can be stated that after 10 weeks of exercises according to Move to Learn programme:

- 5 and 6 y.o. children participating in the programme (test group) benefited much more from the programme in terms of their graphomotor skills (drawing from a presented model) in comparison with children, who did not take part in the programme (control group);
- apart from a higher level of graphomotor skills in 5 and 6 y.o. children, children doing exercises according to the Move to Learn programme (test group) obtained slightly higher results in general school functioning in comparison with children, who did not take part in the programme (control group);
- in comparison with children, who did not take part in the programme, children from the test group (participating in the programme), obtained significantly higher results in terms of their progress concerning emotional and social development.

Final conclusion: doing exercises according to Move to Learn programme systematically for 10 weeks:

- influences the appearance of significant, positive changes in terms of graphomotor skills in 5–6 y.o. children;
- influences appearance of significant, positive changes in terms of emotional and social development of 5–8 y.o. children;
- contributes to a better general pre-school and school functioning of 5–8 y.o. children.

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