

realities and problems that the university activity is facing in the context of harmonization and compliance of curricula with the demanding standards imposed at European level.

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STUDY ABOUT THE DEVELOPMENT OF THE CONDITIONAL MOTOR SKILLS AT THE MIDDLE-SCHOOL LEVEL - 6TH GRADE BOYS – BY APPLICATIVE TRACKS AND PATHS

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Abstract: *The whole variety of motor actions that someone performs in his everyday life or while practicing sports is more or less appropriately performed, according to the degree of development of his motor skills. Over time and until now, there is one idea that was spread and generalized, that in the students' process of physical training, the development of the motor skills is to be considered a secondary aspect for a large number of teachers. They mainly resume to the acquisition, enhancing and improving of some motor skills, specific to the sports branches provided by the curricula in force. Students are reluctant to the appropriate involvement in the development of speed, strength and force. Therefore, the motor skills, in all their forms of expression, can be favourably influenced at this age (10-14*

years old) with multiple means, examples of which are applied tracks and paths. If properly selected and applied, these activities may become attractive for students and may reveal their efficiency. Our paper highlights the advantages but also the limitations of using more interesting work methodologies for pupils, compared with the commonly used classical variants in the physical training of classes of secondary school, a period of time recognized as a difficult one in terms of motor, intellectual, emotional and social development etc.

Keywords: conditional motor skills, applicative pathways, efficiency, puberty, physical training.

Introduction: The development of the motor skills and the training of the motor skills should be understood as a unitary process that takes place in a correlated manner during the semester, year and the education cycle by allocating to each of these objectives the share required by the school curricula. The current middle school physical education programs provide diversified content in order to develop the skills / motor skills through various methods and means: their own / specific or indirectly by means of the sporting games and athletics or gymnastics. Also, taking into consideration the reverse situation, we can say that the acquisition of the basic skills, practical utility and sports - established in the syllabi - is based on the development of the quality indexes / motor skills.

Using his motor skills, the man can overcome his early fatigue that may be intellectual, sensorial, emotional and physical. The motor actions included in the pathways and the relay race generates diverse situations that children must solve alone, being in competition with the others. These solutions create or strengthen a number of skills such as courage, determination, self-confidence, discipline, voluntary adherence to the imposed rules, honesty, spontaneity, and determines a higher participation than that found using conventional methods of educating speed, strength and resistance. The approach of the development of motor skills in middle school will take into account the profound transformations experienced by students during puberty (*1,2,3,4,13,16,17,19*). Synthetically, they refer to:

- The development of their personality and the shaping of their moral profile, intense training and educational demands, powerful motivation for different activities; the sense of belonging to the group according to affinities and interests, including those involving sports.

- The body improves and the feeling of self-consciousness becomes consistent. At the level of the cerebral cortex, gyrus deepen and the number of association fibres increases, thus developing the connections between the different areas of the cortex. Thinking becomes more abstract, problem solving and heuristic methods of solving problems can be used.

- It is the beginning of physical maturation with accelerated transformations at the morphological and functional level, especially between 12 and 14 years old, but with imbalances between the body growth and the development of the internal organs at the chest level, an aspect which often generates troubles to adjusting to effort. An exaggerated development occurs between the lengths of the segments compared to the body: the body elongates, the thorax is narrow, the perimeters and diameters do not follow the same evolution / the transversal development is weak, an aspect which will often lead to the disharmonious / caricature appearance of the body. The girls' trunk is longer and the legs are shorter and the muscles develop especially by elongation.

- The structural imbalance also attracts the modification of the quality of the movements that become clumsy; the position of the centre of gravity changes. Motility is characterized by fluctuations / inconstancy during this period.

The actual curricula of physical education offer the students the possibility to gain the necessary knowledge in order to act upon the physical development and the motor skills, and also the initiation and the consolidation in practicing some disciplines or sport contests: in the

6th grade, three athletic events from different groups – running, jumping, throwing – (those taught in the 5th grade), static and dynamic acrobatic elements from the acrobatic gymnastics, the jump to a gymnastic apparatus, two sport games (one of which was taught in the 5th grade) - see the curriculum for secondary education from 2009 (12,15,18). If for the development of the coordinative capacity elements, the use of movement games and applicative pathways is already a common practice, for the development of the conditional motor skills are constantly used the classical methods offered by the specific scholar literature (5,6,10,14,16).

The applicative routes used during the lesson may include combinations and binding elements like creeping, climbing, escalading, carrying loads, tractions, thrust, balance; to these we can add a part of the basic motor skills: walking and running in different variants, jumping etc. and elements and processes specific to certain branches or sport competitions. In this form, they acquire new positive values such as: combined motor skills development – strength-endurance, speed-agility, strength-speed etc.; the consolidation of the specific athletics habits and skills, team sports, gymnastics and acrobatic gymnastics, jumping; the development of the volitional moral values dramatically raises the emotional state of students and provides a highly dynamic lesson, regardless of the existing material.

The expressions of the conditional motor skills in the curriculum in force from 2009 for the common core classes at the 6th grade are shown in Fig. 1. To these, we also added as achievable objectives the theoretical knowledge about the characteristics of physical exercises for the development of the conditional motor skills and the average values of their indicators according to the chronological and biological age. The classification of the motor skills and the development of their methodology based on age is also approached by Iconomescu T.M./2013/p.28.

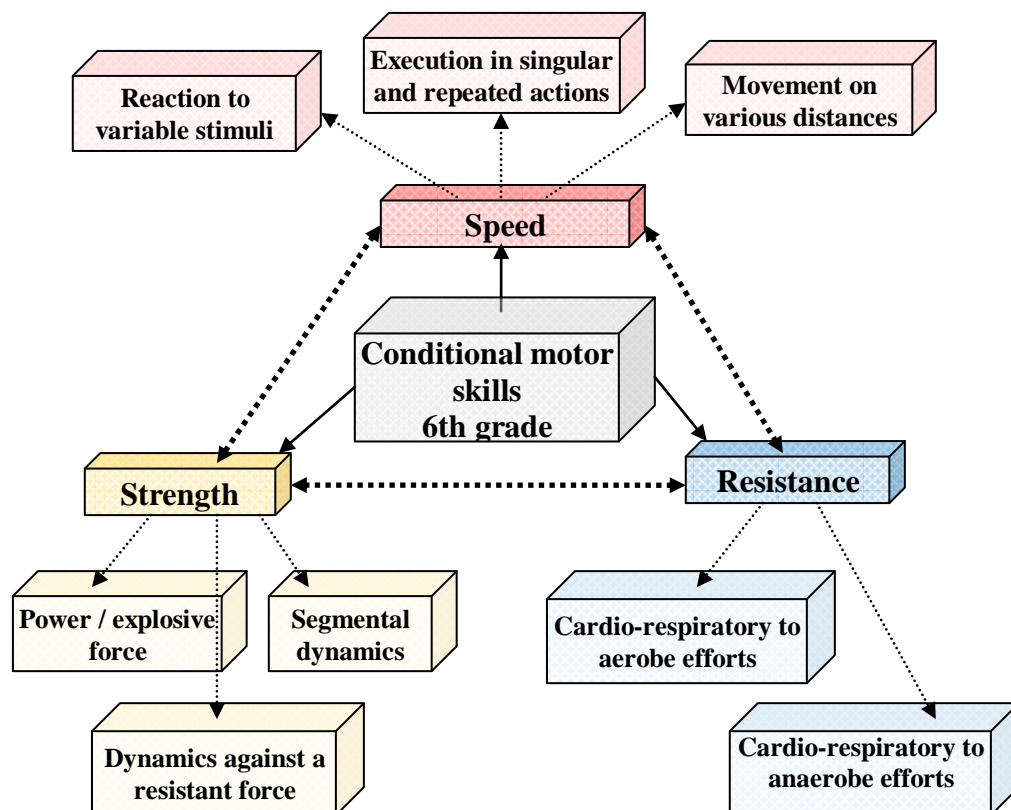


Fig. 1 – Expressions of the conditional motor skills at the 6th grade level

The purpose of this study was determined by the :relatively low level of physical training, found over the years, for the pubertal students; improper participation of the students at the sport classes (especially for strength and endurance activities) and trying to motivate them for this kind of activities; poor motor skills and insufficiently mastered and applied as a result of the physical training deficiencies; the need to adapt the classical methods and means of physical training or to find new means of developing the conditional motor skills because of the poor material conditions from most schools; the small number of physical education classes allocated in the common core of the teaching curricula requires the adaptation of the teaching process in order to achieve the general and specific competencies stipulated in the specific curriculum; the need to program accessible efforts to both sexes, taking into account the major differences of motor potential between girls and boys, specific to puberty.

Working hypothesis: by including the shuttle run and the applicative pathways in the frequently used means in order to solve the tasks of the physical education classes at the middle-school level, we consider that we can improve the motor skills education process and we can favour the accomplishment of the competencies specific to the curriculum of the class, without using the specific methodology of physical training.

Research organization and development: The research methods are the following: study and synthesis of the information from the specific scholar literature, investigation based on questionnaire, pedagogical observation, measurements and tests method, statistical and mathematical methods of representing and interpreting the results(7,8,11,20). The study was organised at the „Alexandru Ioan Cuza” middle-school from Braila Municipality, during the 2015-2016 school year. The students were from the 6th grade (A) (experimental class whose physical training was based only on applicative pathways: 16 boys and 10 girls) and the 6th grade (B) (control class whose physical training was based on the classical instruction methodology regarding the conditional motor skills: 10 boys and 18 girls). Our paper presents – because of the lack of space – only the results obtained and the differences between the averages of the witness group and the experimental group for boys. At the time of the experiment, the students were between 12 and 13 years old. The control tests used in order to evaluate the speed level of evaluation / 4 tests, resistance / 1 test and strength / 8 tests are enumerated in the tables that present the results of the research, most of them being included in the National school system of evaluation. The initial testing occurred between September 14th and September 26th, 2015, and the final testing between June 13th and June 17th, 2016. Table 1 presents the distribution of the number of lessons from the learning units on semesters for each motor skill and their combinations, for both groups.

Table1. Number of hours per study units specific for the motor skills

ELEMENTS FROM THE CURRICULUM	CONTENTS	NO. OF HOURS PER LEARNING UNITS		TOTAL
		SEM. I	SEM. II	
Motor Skills/ 6th grade	Speed	8	6	14
	Skill/coordination	6	10	16
	Strength	8	8	16
	Resistance	-	10	10
	Combined (detent)	8	6	14

Results of the research: we have highlighted in tables, for each motor skill, the values of the differences between the initial testing and the final testing for each studied group / pair samples and also the values of the differences between the initial testing and the final testing for different groups / independent samples.

Both groups of students start their training from initial values almost equal for most of the tests, the results from the initial testing being significant only for three sport tests, where the experimental group has a clear advantage: speed running 50m, trunk lift-ups from a back-down position and trunk lift-ups from a face-down position. This aspect can be explained by the heterogeneity of the training level of the classes and the reduced number of students included in the research; that is why we cannot ascertain that the results are relevant at the national level for the age group that we tested. (See table 2)

Table 2. The value of the difference signification to the *initial testing* for independent samples

No.	Sport test/ Initial testing	Group type/no. of cases	Average	Average difference	Std. error average	Std. deviation	t	P/Sig. 2 tailed
1	Speed running 50m (sec.)	Experiment boys(16) Witness boys(10)	8,150 6 8,213 0	-,06237	,01929 ,02211	,07716 ,06993	- 2,12 6	,046*
2	„Touch the plates” (sec.)	Experiment boys(16) Witness boys(10)	15,54 3 15,43 9	,10475	,22698 ,21305	,90791 ,67374	,336	,740
3	„The falling ruler” (cm)	Experiment boys(16) Witness boys(10)	20,81 20,50	,310	,666 ,922	2,664 2,915	,275	,787
4	Shuttle run 5 x 10 m (sec.)	Experiment boys(16) Witness boys(10)	21,288 1 21,357 0	-,06889	,33053 ,20770	1,32211 ,65681	- ,176	,861
5	Resistance running 800 m (min./sec.)	Experiment boys(16) Witness boys(10)	3:24 3:25	-,01	,010	,050 ,050	- ,548	,590
6	Push-ups (no. of executions)	Experiment boys(16) Witness boys(10)	8,6250 7,8000	,82500	,45529 ,66332	1,82117 2,09762	1,02 5	,319
7	Pull-ups (no. of executions)	Experiment boys(16) Witness boys(10)	4,81 4,60	,213	,319 ,306	1,276 ,966	,481	,635
8	Long jump without take- off (m)	Experiment boys(16) Witness boys(10)	1,6031 1,6340	-,03087	,01521 ,01593	,06085 ,05038	- 1,40 2	,175
9	Bench jumps (no. of executions/30 sec)	Experiment boys(16) Witness boys(10)	18,00 17,50	,500	,492 ,687	1,966 2,173	,592	,561
10	Trunk lift-ups from a back- down position (no. of executions/30se	Experiment boys(16) Witness boys(10)	19,50 15,50	4,000	,492 ,687	1,966 2,173	4,73 4	,000***

	c)							
11	Legs lift-ups from a back-down position (no. of executions/30sec)	Experiment boys(16) Witness boys(10)	7,38 7,60	-,225	,315 ,306	1,258 ,966	- ,513	,613
12	Trunk lift-ups from a face-down position (no. of executions/30sec)	Experiment boys(16) Witness boys(10)	19,50 15,30	4,200	,508 ,633	2,033 2,003	5,17 2	,000***
13	Pelvic lifts (no. of executions/30sec)	Experiment boys(16) Witness boys(10)	14,94 13,50	1,438	,520 ,687	2,081 2,173	1,66 8	,112

*** P<0.05; **P<0.01; ***P<0.001**

The results obtained at the final tests in order to determine the difference between the two groups has significant values only for the three previously mentioned tests during the initial testing. We can state that these differences in favour of the experimental group are not compulsorily due to the value of the implemented curriculum, but are due to an initial gap. Even if the experimental group obtains final values slightly higher than the values obtained by the witness group, they are not statistically confirmed as being significant. There are also two sport tests where the boys from the witness group have better results, but still not statistically significant compared with the experimental group: the “touch the plates” test and the pelvic lifts. (see the results from Table 3)

Table 3. The value of the difference signification to the *final testing* for independent samples.

No.	Sport test/ Initial testing	Group type/no. of cases	Average	Average difference	Std. error average	Std. deviation	t	P/Sig. 2 tailed
1	Speed running 50m (sec.)	Experiment boys(16) Witness boys(10)	8,03 25 8,12 80	-,09550	,02817 ,02332	,11269 ,07376	- 2,61 1	,015*
2	„Touch the plates” (sec.)	Experiment boys(16) Witness boys(10)	15,1 30 14,9 36	,19400	,22823 ,21482	,91290 ,67932	,619	,542
3	„The falling ruler” (cm)	Experiment boys(16) Witness boys(10)	15,13 15,90	-,775	,735 ,960	2,941 3,035	- ,641	,529
4	Shuttle run 5 x 10 m (sec.)	Experiment boys(16) Witness boys(10)	20,65 0 21,16 4	-,51400	,34181 ,21509	1,3672 2 ,68018	- 1,27 3	,216
5	Resistance running 800 m (min./sec.)	Experiment boys(16) Witness	3:17 3:20	-,030	,010 ,010	,040 ,060	- 1,68 2	,114

		boys(10)						
6	Push-ups (no. of executions)	Experiment boys(16) Witness boys(10)	10,81 25 9,800 0	1,0125 0	,48493 ,59255	1,9397 2 1,8738 0	1,32 2	,201
7	Pull-ups (no. of executions)	Experiment boys(16) Witness boys(10)	6,13 5,80	,325	,315 ,490	1,258 1,549	,558	,584
8	Long jump without take-off (m)	Experiment boys(16) Witness boys(10)	1,733 1 1,729 0	,00412	,01060 ,01636	,04238 ,05174	,212	,835
9	Bench jumps (no. of executions /30 sec)	Experiment boys(16) Witness boys(10)	20,25 18,80	1,450	,371 ,663	1,483 2,098	1,90 8	,076
10	Trunk lift-ups from a back-down position (no. of executions /30sec)	Experiment boys(16) Witness boys(10)	21,75 18,90	2,850	,393 ,379	1,571 1,197	5,22 5	,000** *
11	Legs lift-ups from a back-down position (no. of executions /30sec)	Experiment boys(16) Witness boys(10)	9,81 8,80	1,013	,277 ,490	1,109 1,549	1,79 9	,093
12	Trunk lift-ups from a face-down position (no. of executions /30sec)	Experiment boys(16) Witness boys(10)	22,13 18,70	3,425	,364 ,473	1,455 1,494	5,74 3	,000** *
13	Pelvic lifts (no. of executions /30sec)	Experiment boys(16) Witness boys(10)	16,69 16,90	-,213	,546 ,379	2,182 1,197	- ,320	,752

*** P<0.05; **P<0.01; ***P<0.001**

The data analysis through the statistical calculation indicates that using the applicative paths and routes in the education process of the conditional motor skills is a clear success, the differences between the results of the initial testing and the final testing for the experimental group being integrally and highly significant - see Table 4. But this aspect confirms only partially the working hypothesis, because even in the control group, where classical methodology was used to educate motor skills, we have found a significant improvement of the outcomes for the entire battery of tests. (See Table 5 with the initial and final results achieved by the witness group)

Table 4. The value of the difference signification *between the initial and the final testing for the boys from the experiment group.*

No .	Sport test	Group type/ Experiment boys- 16	Average	Average difference	Std. error average	Std. deviation	t	P/Sig. 2 tailed
1	Speed running 50m (sec.)	Experiment boys(TI) Experiment boys(TF)	8,15 06 8,03 25	,11812	,01929 ,02817	,07716 ,11269	5,72 9	,000* **
2	„Touch the plates” (sec.)	Experiment boys(TI) Experiment boys(TF)	15,5 43 15,1 30	,41375	,22698 ,22823	,90791 ,91290	7,11 2	,000* **
3	„The falling ruler” (cm)	Experiment boys(TI) Experiment boys(TF)	20,81 15,13	5,688	,22823 ,666	,91290 2,664	10,7 29	,000* **
4	Shuttle run 5 x 10 m (sec.)	Experiment boys(TI) Experiment boys(TF)	21,28 81 20,65 00	,63813	,33053 ,34181	1,3221 1 1,3672 2	2,75 5	,015*
5	Resistance running 800 m (min./sec.)	Experiment boys(TI) Experiment boys(TF)	3:24 3:17	,070	,010 ,010	,050 ,040	9,40 5	,000* **
6	Push-ups (no. of executions)	Experiment boys(TI) Experiment boys(TF)	8,625 0 10,81 25	-2,187	,45529 ,48493	1,8211 7 1,9397 2	- 9,60 9	,000* **
7	Pull-ups (no. of executions)	Experiment boys(TI) Experiment boys(TF)	4,81 6,13	-1,313	,319 ,315	1,276 1,258	- 6,01 2	,000* **
8	Long jump without take-off (m)	Experiment boys(TI) Experiment boys(TF)	1,603 1 1,733 1	-,130	,01521 ,01060	,06085 ,04238	- 13,2 2	,000* **
9	Bench jumps (no. of executions /30 sec)	Experiment boys(TI) Experiment boys(TF)	18,00 20,25	-2,250	,492 ,371	1,966 1,483	- 9,00 0	,000* **
10	Trunk lift-ups from a back- down position (no. of executions /30sec)	Experiment boys(TI) Experiment boys(TF)	19,50 21,75	-2,250	,875 ,602	2,767 2,555	- 11,6 1	,000* **
11	Legs lift-ups from a back- down position (no. of executions	Experiment boys(TI) Experiment boys(TF)	7,38 9,81	-2,438	,315 ,277	1,258 1,109	- 10,9 2	,000* **

	/30sec)							
12	Trunk lift-ups from a face-down position (no. of executions /30sec)	Experiment boys(TI) Experiment boys(TF)	19,50 22,13	-2,625	,508 ,364	2,033 1,455	- 8,34 5	,000**
13	Pelvic lifts (no. of executions /30sec)	Experiment boys(TI) Experiment boys(TF)	14,94 16,69	-1,750	,520 ,546	2,081 2,182	- 6,57 5	,000**

*** P<0.05; **P<0.01; ***P<0.001**

Table 5. The value of the difference signification *between the initial and the final testing forthe boys from the witness group.*

No.	Sport test	Group type/ Witness boys-10	Average	Average difference	Std. error average	Std. deviation	t	P/Sig. 2 tailed
1	Speed running 50m (sec.)	Witness boys (TI) Witness boys (TF)	8,213 0 8,128 0	,08500	,02211 ,02332	,06993 ,07376	6,10 4	,000** *
2	„Touch the plates” (sec.)	Witness boys (TI) Witness boys (TF)	15,43 90 14,93 60	,50300	,21305 ,21482	,67374 ,67932	6,27 4	,000** *
3	„The falling ruler” (cm)	Witness boys (TI) Witness boys (TF)	20,50 15,90	4,600	,922 ,960	2,915 3,035	7,23 3	,000** *
4	Shuttle run 5 x 10 m (sec.)	Witness boys (TI) Witness boys (TF)	21,357 0 21,164 0	,19300	,20770 ,21509	,65681 ,68018	7,70 9	,000** *
5	Resistance running 800 m (min./sec.)	Witness boys (TI) Witness boys (TF)	3:25 3:20	,050	,010 ,010	,050 ,060	6,57 8	,000** *
6	Push-ups (no. of executions)	Witness boys (TI) Witness boys (TF)	7,8000 9,8000	-2,000	,66332 ,59255	2,0976 2 1,8738 0	- 9,48 7	,000** *
7	Pull-ups (no. of executions)	Witness boys (TI) Witness boys (TF)	4,60 5,80	-1,200	,306 ,490	,966 1,549	- 4,81 1	,001** *
8	Long jump without take-off (m)	Witness boys (TI) Witness boys (TF)	1,6340 1,7290	-,09500	,01593 ,01636	,05038 ,05174	- 6,39 7	,000** *
9	Bench jumps (Witness boys	17,50	-1,300	,687	2,173	-	,000**

	no. of executions /30 sec)	(TI) Witness boys (TF)	18,80		,663	2,098	8,51 0	*
10	Trunk lift-ups from a back-down position (no. of executions /30sec)	Witness boys (TI) Witness boys (TF)	15,50 18,90	-3,400	,687 ,379	2,173 1,197	- 5,20 5	,001** *
11	Legs lift-ups from a back-down position (no. of executions /30sec)	Witness boys (TI) Witness boys (TF)	7,60 8,80	-1,200	,306 ,490	,966 1,549	- 4,81 1	,001** *
12	Trunk lift-ups from a face-down position (no. of executions /30sec)	Witness boys (TI) Witness boys (TF)	15,30 18,70	-3,400	,633 ,473	2,003 1,494	- 5,49 9	,000** *
13	Pelvic lifts (no. of executions /30sec)	Witness boys (TI) Witness boys (TF)	13,50 16,90	-3,400	,687 ,379	2,173 1,197	- 5,20 5	,001** *

* P<0.05; **P<0.01; ***P<0.001

Conclusions and recommendations:

- Using the applicative pathways and routes has the expected efficiency for the experimental group, but does not facilitate significantly better results compared to the results obtained by the witness group. This confirms that in the didactic process we cannot easily give up the specific methods for developing the motor skills, which have proven time effectiveness: the method of repeated efforts with maximum and submaximal intensity, the method of the continuous and uniform efforts, the method of variable efforts, the method of fractionated efforts, working in a circuit, the method of the intense and rapid isotonic contractions etc.
- A certain advantage of the experimental program is the students' higher level of participation, compared with the more limited attitude and interest of the witness group, where the classical methodology often induces lack of interest and boredom. From this point of view, we can state that the students from the experimental group were better motivated for the sport classes.
- We recommend to carefully selecting the skills for the applicative pathways that should be known and managed by the students in order not to get injured. Another important aspect refers to the – dosage planning - number of repetitions, value of charges, distance, speed, the rational combination of the pathway elements, the breaks' length and nature - closely correlated with the morphological and functional possibilities of the working groups. This dosage and choice of the pathways components are adapted to each skill and combination of motor skills to be developed: speed, strength, endurance, explosive force etc.
- Although during the practical activity the use of the applicative pathways is frequent in the process of development of speed and coordinative elements, the experimental curriculum confirms the possibility to successfully use these means also for the strength or resistance development. Testing the accessibility of the means used in the applicative pathways, by

the thorough investigation of the evolution of the multiple functional values in the lesson, could be the subject of new research in the sports field, that would fundament and scientifically validate the content of the didactic activities.

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THE IMPORTANCE, ROLE AND INFLUENCE OF MOVEMENT GAMES IN RAISING SKILL DEVELOPMENT TO CHILDREN IN THE PRIMARY SCHOOL

NANU LILIANA

Summary