REFERENCES:
1. Bompa T.O.   Developing the biometrical qualities (time framing). Bucharest: Exponto, 2001. 282p.
2. Rață G. The methodology of teaching physical education and sports. Iași: PIM, 2008. 337 p.
3. Rață G., Rață B.C. Basic motor abilities (theoretical problems). Bacău: Plumb, 1999. 142 p.
4. Scarlat E., Scarlat M.B. Physical education and sports. Lower secondary text book. Bucharest: E.D.P., 2002. 528 p.

LA METHODOLOGIE DE PROJECTION L'UNITE D'APPRENTISSAGE DE RESISTANCE A LA VALEUR GROUPE INFERIEUR SECONDAIRE AVANCE (8[E] ANNEE)

Résumé: La projection des unités de valeur impose un effort plus élevé que celui demandé par les activités frontales, soit en utilisant des moyens variés, soit en compliquant quelques moyens communs et le dosage différencié, tandis que la durée reste la même quelle que soit le groupe d'élèves entraîné, les thèmes abordant des qualités restrictives aux groupes de travail. La variété des moyens inclus dans le programme expérimental pour chaque aptitude physique et groupe de valeur, tenant compte des limites inférieures et supérieures (Exemple: 2-3 séries x 4-12 répétitions), permet au professeur d'adapter le processus éducatif aux conditions matérielles existantes, mais notamment à la réaction des élèves aux moyens proposés.
Mots clefs: *plan de leçon, traitement différencié, accessibilité, force musculaire, dosage de l'effort*

DEVELOPMENT LEVEL OF COORDINATION SKILLS IN ELEMENTARY SCHOOL PUPILS

Petronel MOISESCU[1], Ali GÜRBÜZ[2]

[1]"Dunarea de Jos" University of Galati, ROMANIA
[2]Department of Physical Education and Sports, Mimar Sinan Fine Arts University, TURKEY

Abstract:
The degree of motor skills manifestation changes with age. To put it simply, three periods of development may be found: a growth phase in childhood and adolescence, a "plateau" phase, and a decrease phase in adulthood. Individual development exhibits, as specialised literature noticed and described, sensitive and critical periods. Sensitive periods are characterised by the more intense response of the body to external stimuli in certain periods. In return, critical periods are seen either as a phase when it is necessary to apply certain stimuli to reach well determined development effects, or as a stagnation, if not plain involution phase.
Keywords: Pupils, elementary education, physical education curricula, motor skills, coordinative skills.

INTRODUCTION

Elementary school includes pupils aged 7-11, an age group representing an essential moment in the child's life due to the changes that occur. Small children (pre-puberty 6–11 year-old girls and up to 12 year-old boys), characterised by the beginning of school and an impetuous gestural behaviour, display an overt attraction towards sport and sporting competitions. This age (as children are small and light) may be considered a highly favourable stage in learning for the basic technical training.

Training coordination, according to specialists, should be introduced when the plasticity of the nervous system is high, and motor habits have not yet become permanent. The scope of coordination training changes in adolescence, when the physical development alters the motor habits already formed. During this stage, the refining of motion should be more important than acquiring new motor skills. In the post-adolescence stage, coordination training may be brought again to a new higher level.

In order to achieve the analysis of the parameters of coordination skills, a set of 11 sporting tests was used, divided according to the 5 manifestation forms of the coordination skills. Thus, in order to assess and regulate the dynamic and spatial-temporal parameters of the motor act, 2 tests were used, viz. marking leaps, and ball throwing to a target with the back turned; to assess balance, 3 tests were used, viz. balance on the gym bench, the dynamic balance test, and the backwards walking balance test; to assess rhythm, the sprint in a given tempo was proposed as a test; to assess spatial orientation, the 4th manifestation form of coordination skills, the square test and the distance assessment test were used; to assess movement

coordination, the relay, hexagonal obstacle and Matorin tests were used.

The motor test was performed on a lot of 255 boys aged 7-11, out of whom 64 pupils aged 7 and 8, 63 boys aged 8 and 9, 63 boys aged 9 and 10, and 65 boys aged 10 and 11. The tests were organised and carried out in the city of Galați.

As a result of the tests applied to the subjects, the statistical indices were calculated, concerning the value distribution and result homogeneity. The average obtained from these measurements are shown in Table 1.

To assess the coordination skill, i.e. *"the assessment and regulation of the dynamic and spatial-temporal parameters of the motor act"*, two tests were used, viz. "marking leaps" and "backwards overhead ball throw to a target".

In the event called *marking leap* a continuously increasing progress is to be observed, with different growth rhythms. The boys' performance has an average of 12.23 cm in the first grade, and an average of 5.39 cm in the fourth grade, thus registering an increase of 107.69%. At the same time, the progress in absolute value during the four years of study is 6.84 cm.

The most significant progress is seen in the third and fourth grades. Thus, in absolute value the progress made is 3.68 cm, and 2.21 cm respectively.

The analysis of the indices on homogeneity in this test evinces that the standard deviation is between 4.23 and 1.1, and the variability coefficient is between 34.57% and 20.31%. The highest homogeneity is recorded at the end of the cycle, i.e. in the fourth grade.

The second test, *backwards overhead ball throw to a target,* shows that the subjects' performances go up with age. Boys register a progress index of 44.65% during the four years.

In absolute value, the boys' progress is 1.92 points. The best performance occurs in the second and third grades when the group averages increase by 0.94 points, and 0.56 points respectively, meaning an increase of 21.9%, for the second grade, and 10.61% for the third grade.

Just like in the initial test, the highest homogeneity occurs in the fourth grade, i.e. at the end of the cycle.

Table 1. Centralisation of the 4-year evolution of coordination skills in boys (n=255)

No.	Manifestation forms of the coordination skills	Test	grade	Subject no.	$\bar{x}$	δ	cv	± m
1	Assessment and regulation of the dynamic and spatial-temporal parameters of the motor act	Marking leap (cm)	1	64	12.23	4.23	34.57	0.53
			2	63	11.28	3.24	28.74	0.41
			3	63	7.60	1.55	20.43	0.20
			4	65	5.39	1.10	20.31	0.14
		Ball throwing to a target (pct)	1	64	4.30	1.98	46.11	0.25
			2	63	5.24	2.33	44.54	0.29
			3	63	5.79	2.24	38.61	0.28
			4	65	6.22	1.96	31.48	0.24
2	Balance maintenance	Balance on the gym bench (sec)	1	64	26.90	3.65	13.57	0.46
			2	63	23.88	3.29	13.78	0.41
			3	63	20.81	2.62	12.58	0.33
			4	65	15.39	1.44	9.39	0.18
		Dynamic balance test (cm.)	1	64	64.38	17.12	26.60	2.14
			2	63	58.71	11.54	19.65	1.45
			3	63	53.68	7.68	14.32	0.97
			4	65	46.88	4.61	9.84	0.57
		Backward walking balance (pct)	1	64	33.19	6.22	18.73	0.78
			2	63	38.43	5.07	13.20	0.64
			3	63	42.84	3.94	9.21	0.50
			4	65	47.08	3.00	6.38	0.37
3	Rhythm sense	Sprint in a given rhythm (sec)	1	64	1.64	0.36	21.92	0.04
			2	63	1.41	0.49	34.46	0.06
			3	63	1.37	0.44	32.20	0.06
			4	65	0.86	0.38	43.48	0.05
4	Spatial orientation	The square test (sec)	1	64	14.68	2.37	16.16	0.30
			2	63	13.67	2.32	17.01	0.29
			3	63	10.65	1.25	11.72	0.16
			4	65	9.44	1.23	12.99	0.15
		Distance	1	64	216.45	74.43	34.38	9.30

		assessment test (cm)	2	63	180.30	49.06	27.21	6.18
			3	63	136.52	32.86	24.07	4.14
			4	65	100.97	22.78	22.56	2.83
5	Movement coordination	Relay (sec)	1	64	16.22	1.76	10.84	0.22
			2	63	15.56	1.55	9.97	0.20
			3	63	14.35	1.24	8.63	0.16
			4	65	13.85	1.01	7.28	0.13
		Hexagonal obstacle (sec)	1	64	46.07	6.65	14.44	0.83
			2	63	34.32	3.31	9.64	0.42
			3	63	29.00	2.47	8.52	0.31
			4	65	25.08	1.75	7.00	0.22
		Matorin (grd)	1	64	257.81	28.31	10.98	3.54
			2	63	278.57	30.53	10.96	3.85
			3	63	290.79	18.95	6.52	2.39
			4	65	300.77	17.79	5.92	2.21

To assess the coordination skill named *"balance maintenance"*, three tests were applied, viz. balance on the gym bench, the dynamic balance test, and the backwards walking balance.

The results of the test *gym bench balance* prove the increasing differentiated evolution of the performance achieved according to the grade. In regard of the boys' group averages, this test displays an ascending evolution with age. Thus, from a group average of 26.9 sec at the beginning of the elementary school cycle, the end of the school cycle brings an average of 15.39, which represents a progress of 42.78%, i.e. an improvement of the average by 11.51 sec. Notable performances were obtained in the fourth grade, when the group average improves by 26.05%, viz. 5.42 sec in absolute value.

The standard deviation improves, from a value of 3.65 in the first grade and a variability coefficient of 13.57% to values of 1.44 for the standard deviation and 9.39% for the variability coefficient.

The second test applied to assess the ability to maintain the balance, i.e. *the dynamic balance test* indicates a continuous increase of performances.

The evolution of the group average during the four years shows a total progress of 17.5 cm, respectively 27.18 %. The sharpest increase occurs in the fourth grade, when the group average improves the third grade average by 12.68 %, representing 6.81 cm in absolute value.

By the additional analysis of the homogeneity indices in this test, a homogeneity increase is noticed from the first grade to the fourth grade. The standard deviation evolves from values of 17.12 in the first grade to values of 4.61. The situation is similar in the case of the variability coefficient (26.20 – 9.84).

In the test named *backward walking balance* the evolution of the data presented shows that the improvement of the group average is uniformly slow during the four years, with an increase between 4.24 and 5.24 points per year.

In this test, the most significant increases register in the second grade when the group average increases by 5.24 cm as compared to the first grade. Speaking percentually, the increase is 15.78% during the four years of the cycle, the group average undergoes an improvement by 41.84%, respectively 13.89 points in absolute value.

Regarding the homogeneity of all subjects in the third test, it may be said that the standard deviation is comprised between 6.22 and 2.97, and the variability coefficient is between 18.73% and 6.29%. The highest homogeneity occurs at the end of the cycle, viz. in the fourth grade.

The third form of manifestation of the coordination skills– rhythm sense – was applied to the male subjects as the test named "*sprint in a given rhythm*".

The subjects make a total progress of 0.78 secs in absolute value during the four years, respectively 47.38%. The lowest progress is made in the third grade, 0.04 secs, and the highest in the fourth grade, when the group average increases by 36.92%, respectively 0.51 secs in absolute value.

Regarding the homogeneity of all subjects in this test, it may be noticed that the standard deviation is between 0.49 – 0.27 and the variability coefficient is placed between 43.48% and 15.87%. The highest homogeneity is seen in the first grade.

The fourth form of manifestation of the coordination skills – spatial orientation – a battery of two tests was used, viz. the square test and the distance assessment test.

For the *square test*, the performance increases differently, according to the grade of the subjects.

The progress made during the four years of study is 5.24 secs in absolute value, which is slightly superior to the progress made by the girls. From a value of 14.68 secs in the first grade, the fourth grade reaches a group average of 9.44 secs. Percentually

speaking, the increase is 35.67%. the highest increase of the group average is obtained in the fourth grade, which witnesses a 22.07% progress as compared to the previous grade, viz. an increase of 3.02 secs in absolute value.

Analysing the evolution of the indices regarding the homogeneity of this test, an increase may be seen from the first grade to the fourth grade. The standard deviation evolves from values of 2.37 in the first grade to 1.23, the same being valid for the variability coefficient: 16.16–12.99.

The second test selected for administration to subjects – *the distance assessment test* – shows that the group averages register an ascending evolution.

The evolution of the subjects' averages starts at a performance of 216.41 cm in the first grade, and reach a performance of 100.97 cm, viz. an increase of the performance by 115.48 cm, i.e. 53.35%., the improvement of the group average is relatively constant along the four years of the study, with higher progress in the third and fourth grades. Thus, the fourth grade improves the group average by 26.04% as compared to the previous grade, and the third grade improves the group average by 24.28%. in absolute value, these increases are 43.78 cm and 35.55 cm respectively.

When analysing the variability coefficient, it may be noticed that it displays a slight improvement over the four years analysed. At the beginning of the cycle, i.e. in the first grade, it has values of 34.38%, reaching (in the fourth grade) values of 22.56%. the highest homogeneity is found at the end of the learning cycle, i.e. in the fourth grade.

The fifth manifestation form of the coordination skills – movement coordination – was assessed by using a battery of tests, viz. relay, hexagonal obstacle and Matorin.

In the first test applied to assess the general coordination of movements, viz. *relay*, it may also be observed that the evolution of the group averages is positive, increasing with age. The boys register a progress index of 14.61% during the four years of study. In absolute value, the progress made is 2.37 seconds. The highest progress is made in the third grade, when the value of the performance as compared to the previous grade is improved by 7.78%, respectively 1.21 seconds in absolute value.

Regarding the homogeneity of all subjects in the relay test, it is noticeable that the standard deviation is within the interval 1.99 – 1.01, and the variability coefficient is under 11.34%, the highest homogeneity is seen at the end of the cycle, i.e. in the fourth grade.

The analysis of the second test, *hexagonal obstacle*, shows that the evolution of the movement coordination skill increases differently, function of the grade the subject is in. The progress in absolute value is 20.99 secs, respectively 45.56%. The sharpest increase in the group average occurs in the second grade, when the absolute value of the increase is 11.74 seconds, i.e. 25.49%.

In respect to the homogeneity of all the subjects in this test, it is noticeable that the standard deviation is between 14.44 and 2.1, and the variability coefficient ranges between 14.7% and 7.0%. the highest homogeneity is registered at the end of the cycle, in the fourth grade.

The averages evolution in the third test, i.e. *Matorin* increases in time. In the boys' case, the progress made in the four years under study is 42.96 degrees, i.e. 16.66%. most progress occurred in the second and third grades, when the increase is 20.76 degrees, respectively 12.22 degrees in absolute value. Percentually, these values are 8.05% and 4.39%.

The analysis of the variability coefficient in the Matorin test yields a slight increase during the four years under investigation. At the beginning of the cycle, in the first grade, its values are 10.98%, while in the fourth grade they are 5.92%. as expected, the highest homogeneity is registered in the fourth grade.

CONCLUSIONS

Regarding the coordination skills, all the five manifestation forms are characterised by an increase with age. Specialised literature does not contain standardised descriptors for these manifestation forms. Our experiment confirms the assertions of all the experts in the field, i.e. young pupils are the most prone to developing coordination skills, because these are in a progressive dynamics, viz. these indices are improvable. They are in continuous progress for all subjects, but the sensitive periods differ according to age. The periods characterised by the highest increase are the third and the fourth grades, as follows:

1. the assessment and regulation of the dynamic and spatial–temporal parameters of the motor act – the third grade;
2. balance maintenance – third grade;
3. rhythm sense – fourth grade;
4. spatial orientation – third grade;
5. movement coordination – third grade.

The variability coefficient (calculated as percent) expresses the ratio between the standard deviation and the arithmetic average, providing the possibility to measure the homogeneity degree of the group(s), thus enabling the comparison among groups measured with different measurement units.

The closer to zero the variability coefficient, the weaker the variation, and the higher the homogeneity of the group, as the average has a high degree of significance. The higher the variability coefficient, the more intense the variation, the more heterogeneous the group, and the average is accordingly less significant. It may therefore be stated that this index may be used as a test in implementing the grouping method.

In this respect, our approach was to cumulate all the values of the variability coefficients in order to determine the class with the highest level of homogeneity on the whole; considering that homogeneity increases towards the end of the learning cycle, it may be concluded that the fourth grade is the most favourable for the development of coordination skills.

REFERENCES
1.   Bompa T. O. Periodizarea: Dezvoltarea calităţilor biomotrice. Constanţa: Ex Ponto, 2001, p. 256-263.
2.   Chicu V. Dezvoltarea capacităţilor coordinative ale elevilor claselor primare prin aplicarea jocurilor de mişcare in lecţiile de educaţie fizică. Teză de doctor în pedagogie. Chişinău, 2006. 217 p.
3.   Conzelman A. Dezvoltarea capacităţilor motrice. În: Capacităţile motrice. 2001, nr 122, trim I, p. 5-28.
4.   Crăciun G. Dezvoltarea capacităţilor de coordonare în pregătirea tehnică a debutanţilor în tenisul de masă (vârsta 7-10 ani). Teză dr. în ştiinţe pedagogice. Chişinău, 2001, 180 p.
5.   Dragnea A., Mate-Teodorescu S. Teoria sportului. Bucureşti: FEST, 2002. 610 p.
6.   Epuran M. Metodologia cercetării activităţilor corporale – Exerciţii fizice, sport, fitness. Bucureşti: FEST, 2005. 410 p.
7.   Hahn E. Antrenamentul la copii şi juniori. Bucureşti: C.C.P.S., 1996, nr.3-4, p. 7-23.
8.   Hirtz P., Sass H. Practicarea jocurilor sportive şi perfecţionarea calităţilor de coordonare. Korpererziehung. 1988. 410 p. (traducere).
9.   Manno R. Bazele teoretice ale antrenamentului sportiv. Bucureşti: C.C.P.S., 1996. p. 14-68, 135-148.
10.   Manno R. Pregătirea sportivă la copii şi adolescenţi. În: Efecte ale practicării sportului de performanţă la copii şi juniori. Bucureşti: C.C.P.S., nr. 102(1). 1996. p. 60-80.
11.   Raţă G. Didactica educaţiei fizice şi sportului. Iaşi: PIM, 2008. p. 13-324.
12.   Roman C. Teoria şi metodica activităţilor motrice pe grupe de vârstă. Oradea: Universitaţii Oradea, 2008. p. 7-120.
13.   Rotaru A. Studiu experimental privind dinamica capacităţii motrice la copiii preşcolari şi evidenţierea influenţei exerciţiilor de viteză-forţă asupra acesteia. Teză dr. în pedagogie. Bucureşti 1997, 196 p.
14.   Starosta W., Hirtz P. Dezvoltarea capacităţilor motrice. În: Capacităţile motrice. 2001, nr 122, trim I, p. 29-53.

LA COORDİNATİON DU DÉVELOPPEMENT DES CAPACİTÉS AUX ÉLÈVES DES ÉCOLES PRİMAİRES

Résumé:
Le degré de manifestation de la motricité évolue avec l'âge. Simplifier au maximum, peuvent être mis en trois périodes de développement: une phase de croissance dans la petite enfance et l'adolescence, une phase de "plateau" et une régression progressive à l'âge adulte. Dans le développement individuel ont été observés et décrits dans la littérature certaines périodes sensibles et les périodes critiques. Les périodes sensibles est caractérisé en ce que le corps, dans certaines périodes, de répondre plus intensément que d'autres à des stimuli externes. Toutefois, les périodes critiques sont considérées soit comme une phase dans laquelle, si elle cherche à développer des effets bien définis, est nécessaire, être appliquée à certains stimuli, ou comme une phase de stagnation, si ce n'est pas une régression.
Mots-clés*: les élèves, l'enseignement primaire, programmes d'éducation physique, les compétences motrices, les compétences de coordination.*

THEORETICAL CONCEPTS OF EARLY EDUCATION/ DEVELOPMENT OF CHILDREN'S MOTOR AND PSYCHOMOTOR SKILLS THROUGH JUDO

Adriana NEOFIT, PhDc

University of Piteşti, ROMANIA

Abstract:
The issues related to the early education and development of motor and psychomotor skills is of tremendous importance nowadays, that is why it is necessary to approach the didactic strategies able to develop and educate the components of psychomotor skills in judo, thus developing the ability to analyse situations, take decisions, and coordinate motions from a visual-motor and auditory-motor perspective, correlated with the education/ development of attention and concentration ability, the static and dynamic balance, the spatial-temporal orientation, general and intersegmental coordination, kinaesthetic sense and muscle tone.
Keywords*: Judo, motor skills, psychomotor skills, education*