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Original article

ANALYSIS OF THE LEVEL OF TECHNICAL PREPARATION OF CHILDREN AGED 9-10 YEARS LONG JUMP

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Abstract

Browsing the theoretical information and studies related to training children and specifically the level of motor capacity, we decided to check the motor possibilities of a group of children with a protocol of observation drafted after viewing the videos recorded when performing the assessed event, namely the 50m sprint event. Therefore, in conducting the research, we considered it necessary to verify the following *hypothesis*:

- for 9-10-year-old children, the use of a grid for assessing the technical execution along with the sports result allows the detection of actions which require careful training.

The objective of the research is to carry out a study in which we used an assessment grid for standing long jump technical execution, but also the sports result recorded by the children. We have developed our own grid and the assessment based on it, was made by watching the recordings and video of each child, being conducted with the performed motor capacity assessment events.

The research subjects are represented by 14 children aged between 9-10 years, participants in athletics competitions from September 2020 to February 2021. For the research we used as evaluation tools:

- *the assessment grid of the* technical execution for standing long jump, based on the development of the recording event;

- *the standing long jump event* with recording the distance by using meter.

The results show us a relatively good level of mastery of the execution technique, the scores obtained based on the assessment grid being above the value given to the qualifier "good".

Keywords: athletics, children, standing long jump.

Introduction

Knowing the development trends of a sports is very important for guiding the instructive-educational training process for children and juniors. At present, education is continuously adapting and improving, and the multiplicity of policies, methods and procedures can be clearly observed very easily (Derse, E. T., 2012).

The specificity of the age of 9-10 years, in motor plan, is characterized by a motor learning capacity with reduced possibilities of fixing movements. Dragnea, A and Bota, A. (1999) specify that 'only systematic repetition integrates and stabilizes the new structure in the child's motor repertoire. 'Real perception and understanding are recorded by a directed observation on a correct demonstration and by a perceived execution, intuitively analyzed by the student (Rață G., 2009).

Optimizing the training of athletes is a universal goal of teachers, coaches, researchers around the world. Coaches' orientation towards the use of modern technology must be achieved by demonstrating the opportunity and benefits of these methods on sports results, which in children translate into accumulations and consolidation of skills (Ives, JC, 2002). Motor activity in childhood is nowadays receiving more and more attention in terms of science and pedagogy.

Studies (Aggarval, J., 2009) have shown that there is a certain behavioral emphasis that an individual needs to acquire and improve skills. Moreover, an individual's performance once he has mastered his abilities seems to be strongly influenced by psychological factors (Kreiner-Phillips, 1993).

Facilitating learning with information technologies has increased efficiency if we take into account the individual characteristics of the child, his abilities and preferences, ensuring, according to Bontaș, I. quoted by Balint, G. (2008), 'the existence of the inverse connection (feedback) between the student and the program, increasing the efficiency of the learning process'.

In jumping tests, the component phases are

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determined by the interaction of internal and external forces that aim to achieve the body trajectory into the air, as long or as high as possible. Thus, it is known that the explosive force of these athletes is important in performance goals. (Rață G., 2021).

In children athletics training, the daily monitoring and the periodic assessment of the stage of mastering the technique in a test is a permanent objective. 'The differentiation between jumping is given by the particular aspects of their phases. (Rață, 2002) Each jump is composed of a cyclic phase represented by take-off and an acyclic phase, represented by the jump itself, and the result is influenced by the technical value of the phases and the value of psychomotor skills. These phases are determined by the interaction of internal and external forces that aim to achieve the body trajectory into the air, as long or as high as possible.

Methods

Knowing the theoretical information and studies related to children's education and especially the level of motor ability, we decided to appreciate the technical motor possibilities of a group of children, using an observation protocol developed by us. The assessment was made based on the protocol and based on watching the videos recorded once the test was held during the evaluation process, at the standing long jump. Therefore, in conducting the research, we considered it necessary to verify the following hypothesis:

- for children aged 9-10, the use of a grid to evaluate the technical performance together with the sports result allows the detection of actions that require careful training.

The objective of the research is to carry out a study in which we used an assessment grid for standing long jump technical execution, but also the sports result recorded by the children. We have developed our own grid and the assessment based on it was made by watching the recordings and video of each child, being conducted with the performed motor capacity assessment events.

The research subjects are represented by 14 children aged between 9-10 years, participants in athletics competitions from September 2020 to February 2021. For the research we used as evaluation tools:

- *the assessment grid of the* technical execution for standing long jump, based on the development of the recording event;

- *the standing long jump event* with recording the distance by using meter.

The technical performance assessment grid for standing long jump can be found in table no. 1. The assessment of the execution is made on five moments which influence the jump technique, each moment being assessed with points for three types of actions of the movement, such as actions considered wrong, good and very good.

Table no. 1 - Technical performance assessment grid for standing long jump

Item No.	Assessed moments	Points and grades awarded		
		1 point (wrong)	3 points (good)	5 points (very good)
1	For action of sitting starting position	sitting position with arms swinging up and down	squat movement with arms backwards	flexion movement of the knees almost 90° with the elbows bent backwards
2	For jumping off two feet	detachment from the entire sole without the action of the upper limbs	detachment by rolling the sole without the action of upper limbs or reverse action	detachment by rolling the sole simultaneously with the action of upper limbs
3	For flight action	tot raising the knees and thigh forwards and keeping arms down	raising the knee up to 45° and holding back the elbows	raising the knee over 45° at the same time as bringing the arms forwards
4	For action on landing	landing with palms behind the torso and rolling the torso backwards when landing	landing with knees bent, and falling back on the seat	landing with bent knees at the same time as bringing arms forwards
5	For action when leaving the landing space	unbalanced standing up and stepping back on one foot	balanced standing up and stepping back on one foot	balanced standing up and stepping ahead on one foot and leaving the sandbox
6	For standing long jump	jumping with wrong start, with successive	jumping off two feet, unbalanced	jumping off two feet, pulling arms forwards and balanced

	jumping off two feet with one foot ahead and unbalanced landing	landing	landing

Results

Standing long jump was appreciated according to the grid presented in table no. 1, after watching the video recordings of the athletes included in our study, and the results can be found in table no. 2.

For the action of the sitting starting position, the 14 female athletes got *an average score* of 2.71 points. The calculated value is small, which shows us the low level of children when performing this motor action.

Following the data presented in table no. 2 and figure no. 1 we notice that:

- **12 girls out of 14** get the 'good' rating for squat movement with arms backwards;
- **2 girls out of 14** get the 'sufficient' rating for the sitting position with arms swinging up and down;
- *Standard deviation* has a value of 0.72 points, a maximum value of 3 points and a minimal value of 1 point.

Table no. 2 The average values of the results of the technical assessment and performance of the standing long jump - girls

Item no.	Init.	Aps	D2p	Az	Aat	Ai	Sll	Total points of 30	Percentage of %	Perf. (m)
Media		2.71	4.14	3.85	4.28	4.28	3.71	23	76.66	1.49
St. deviation		0.72	1.29	1.51	1.26	1.48	1.48	6.73	22.45	0.24
V. max.		3	5	5	5	5	5	28	93.33	1.90
V. min.		1	1	1	1	1	1	8	33.33	1.10
Percentage%	G	14.29	7.14	14.29	7.14	14.29	14.29			
	B	85.71	28.58	28.58	21.43	7.14	35.71			
	Fb	-	64.28	57.13	71.43	78.57	50			

Legend: Aps = action of the sitting starting position; D2p = action of jumping off two feet; Az = flight action; Aat = action on landing; Ai = action on leaving the landing space, Perf = performance; G = wrong = 1 point; B = good = 3 points; Fb = very good = 5 points

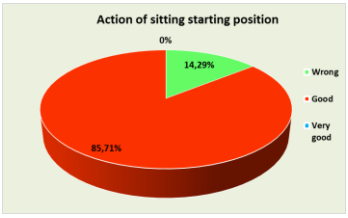

Figure no. 1 Graphical representation of the action of sitting starting position

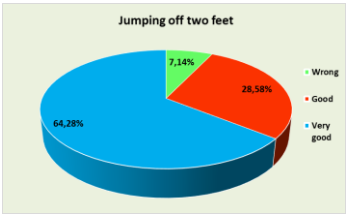

Figure no. 2 Graphical representation of jumping off two feet

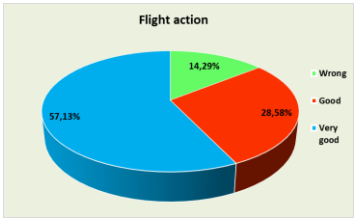

Figure no. 3 Graphical representation of the flight action

For the action of jumping off two feet an *average of 4.14 points* was registered, a value close to the maximum value, which shows us that the level of execution of this motor action is good.

In table no. 2 and figure no. 2, we notice the following aspects:

- **9 girls out of 14** obtained the 'very good' score for detachment by rolling the sole simultaneously with the action of upper limbs;
- **4 girls out of 14** obtained 'good' score for detachment by rolling the sole without the action of upper limbs or reverse action;
- **only 1 athlete out of 14** obtained 'insufficient' score for detachment from entire sole without the action of upper limbs;
- *standard deviation* has a value of 1.29 points, a maximum value of 5 points and a minimum value of 1 point.

For the flight action, the data processing presented in table no. 2 and figure no. 3 shows us the following aspects:

- *the average of the points* registered by the 14 children is 3.85 points, a value that is close to the average value granted for this action, which shows us that the athletes do not yet master this action very well;
- **8 girls out of 14** obtain 'very good' score for raising the knee over 45° at the same time as bringing the arms forwards;
- **4 girls out of 14** obtained 'good' score for raising the knee up to 45° and keeping the elbows back;

- 2 girls out of 14 obtained 'sufficient' score for not raising the knees and thigh upwards and keeping the arms down;
- *standard deviation* has a value of 1.51 points, a maximum value of 5 points and a minimum value of 1 point.

For landing action data in table no. 2 and figure no. 4 show us the following aspects:

- *the average of the points* registered by the group of girls is 4.28 points, a value close to the maximum value granted for the execution of this action, which shows us that the landing is appropriated by most athletes in a correct manner;
- **10 girls out of 14** obtained 'very good' score for landing with the knees bent at the time of landing at the same time as carrying the arms forwards;
- **3 girls out of 14** obtained 'good' score for landing with knees bent at the time of landing, and falling back on the seat;
- **1 girl out of 14** received 'sufficient' score for landing with the palms behind the torso and rolling the torso back at the time of landing;
- *standard deviation* has a value of 1.26 points, a maximum value of 5 points and a minimum value of 1 point.

Figure no. 4 Graphical representation of landing action

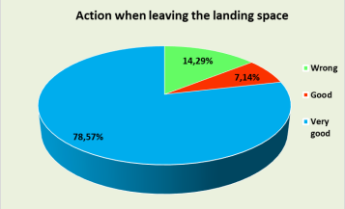

Figure no. 5 Graphical representation of action when leaving the landing space

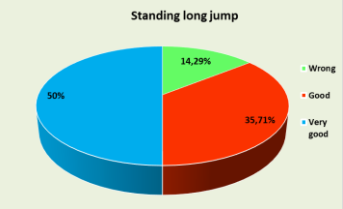

Figure no. 6 Graphical representation of score for standing long jump

For the action when leaving the landing space data in table no. 2 and figure no. 5 show the following aspects:

- *the average of the points* registered by the group of girls is 4.28 points, a value close to the maximum value granted for the execution of this action, which shows us that the athletes correctly mastered the action;
- **11 girls out of 14** obtained 'very good' score for landing with the knees bent at the time of landing at the same time as carrying the arms forwards;
- **1 girl out of 14** obtained 'good' score for landing with the knees bent when landing, and falling back on the seat;
- **2 girls out of 14** received 'sufficient' score for landing with palms behind the torso and rolling the torso backwards when landing;
- *standard deviation* has a value of 1.48 points, a maximum value of 5 points and a minimum value of 1 point.

For standing long jump – global action, the data in table no. 2 and figure no. 6 show us the following aspects:

- *the average of the* points registered by the group of girls is 3.71 points, a value that shows us that the execution technique can still be improved by most athletes;
- **7 girls out of 14** obtained *'very good'* score for jumping off two feet, pulling arms forwards and balanced landing;
- **5 girls out of 14** obtained *'good'* score for jumping off two feet, unbalanced landing;
- **2 girls out of 14** received '*wrong'* for performing the jump with the wrong start, with successive jumping off two feet, with one foot forwards and unbalanced landing;
- *standard deviation* has a value of 1.48 points, a maximum value of 5 points and a minimum value of 1 point.

Following the calculation of the Pearson-r correlation coefficient, for the actions assessed for the standing long jump (girls), we obtained the data shown in table no. 3.

Table 3. Pearson correlation for the results of the technical assessment and performance of the standing long jump - girls

Actions	Aps	D2p	Az	Aat	Ai	Sll	Total_P	Perf
Aps	1	.375	.520	.096	.366	.487	.491	.344
D2p		1	.877**	.725**	.616*	.662*	.871**	.600*
Az			1	.826**	.839**	.800**	.980**	.658*

Aat	1	.850**	.780*	.882**	.548*
Ai		1	.801**	.902**	.424
Sll			1	.904**	.477
Total_P				1	.617*
Perf					1

Score: *p<.05; **p<.01

Legend: Aps=action of the sitting starting position; D2p=action of jumping off two feet; Az=flight action; Aat=action on landing; Ai=action on leaving the landing space; Sll=standing long jump; Total_P=total points; Perf=performance recorded G=wrong=1 pnt; B=good=3 pnts; Fb=very good=5 points

Following the analysis of the results obtained by applying the Pearson correlation (table 3) we found correlations between the following variables:

– *very high correlation* (*where* r ϵ [0.8; 1]) *between* action of jumping off two feet and flight action *(.877)* and total points (.871), between flight action and action on landing *(.826)*, action when leaving the landing space *(.839)* and total points *(980)*; between landing action and total points *(.902)*; between standing long jump – global action and flight action *(.800)*; between standing long jump – global action and action when leaving the landing space *(.801);* between standing long jump – global action and total points *(.904)*. These values show that there is a good mastery of the execution technique and of the assessment actions of standing long jump;

– *a high correlation* (*where* r ϵ [0.6; 0.8]) *between* action of jumping off two feet and flight action *(.725)* and action when leaving the landing space *(.616)* and performance achieved *(.600)*; between flight action and performance *(.658)* and between total points and performance *(.617;* between action of jumping off two feet and standing long jump *(.662*); between action on landing and standing long jump *(.780).* These values highlight the possibility of continuing technical training at those times and actions;

- *a reasonable correlation (where* r ϵ [0.4; 0.6]), between action of sitting starting position and flight action *(.520) and total points (.491)*, between *action on landing and performance (.548)* and action when leaving the landing space and sports performance *(.424);* between action of sitting starting position and standing long jump *(.487);* between standing long jump and performance achieved *(.477)*. These values highlight the idea that there is a possibility to improve the correlation by approaching training that focuses on improving these movement actions in the standing long jump;

- *a weak correlation* (*where* r ϵ [0.2; 0.4]) between action of sitting starting position and action of jumping *(.375)* and action of leaving the landing space *(.366)* and performance *(.344)*. The values show us a weak correlation, some moments and actions of movement show the need to improve the technical execution, through a correct and direct training process;

- *a non-existent correlation* (where r ϵ [0; 0.2]) between action of sitting starting position and action on landing *(.096)*. This value highlights the absence of a correlation at this level and shows the need to improve technical execution, through a targeted training process;

From the analysis of the data recorded at the standing long jump we notice that 5 out of 6 average scores calculated for specific actions have values above the score given for the score 'good', which leads us to say that the 14 athletes included in this study mastered in a good way the technique of performing this jump.

The high and very high correlations established mainly between the total accumulated score, according to the proposed assessment grid, and the other actions in the standing long jump highlight the correct direction of the training proposed to these athletes.

Conclusions

Through this research we want to model the ability of coaches to evaluate the technique of standing long jump and its role in achieving sports performance. The use of the technical performance evaluation grid that highlights the correctness or mistakes of each action is an objective tool and is easy to apply nowadays. Performing an analysis using correlation coefficients (in our case Pearson) is a possibility to orient the training process in certain correct directions.

According to Williams, A.M. (2003), the means used by the coach in preparing the children can have major repercussions in their future conduct, in their development as people.

It was confirmed the hypothesis according to which the use of a grid for evaluating technical performance together with the sports result allows

the detection of actions that require careful training in children aged 9-10, which is supported by the value of correlations between sitting starting position and action on landing (.096), sitting starting position and jumping off two feet (.375), sitting starting position and the performance of female athletes (.344).

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