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Study on the Efficiency of Some Formative Athletics Programs on Motor Quality Improvement in the Case of Children Aged 6-9

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Abstract

We are witnessing a decreasing trend in the average age of Olympic and world champions; this creates the need for developing a formative programme in athletics targeting children before the age of puberty, in the 6-9 years age range, based on the usage of applicative tracts and relay races adapted to the particularities of that age. The study has been developed along 5 years starting with an initial test at the beginning of the school year continuing with an intermediary testing after 5 years of applying the athletic programme and it will finish when the school year ends with a final examination; the children took part in 2 classes per week, the classes lasting 90 minutes. As a result of these tests an improvement of speed has been noticed which has also been proved statistically.

Keywords: speed, force, training, early training, athletics, pre-puberty age;

1. Introduction

In the contemporary sport we are witnessing a tendency towards the lowering of the age when sport training begins, this tendency being manifested in selection strategies, in sport orientation and in early training in many sport branches such as: artistic skating, hockey, swimming, gymnastics etc.

In athletics we can also notice an increase in the number of world, European, regional competitions, in the case of young children (cadets), thus showing the assimilation of early training which can begin around the age of 6, contrary to other points of view which recommend the first training phase to begin around the age of 9 or 10. Children always seek confrontation and look for situations that allow them to compare themselves to

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other play mates. Athletics, through its variety of tests, offers such a type of interaction (Bourdon & Gozzoli, 2006).

For the athletics to be considered a privilege of meeting new children, we, the adults, experts in this domain, must create certain situations and competitions adapted to the different age particularities.

Weineck (1997) considers that this age "is the most favourable phase in motor learning...". Some research by Knappe has proved that running on 60 m regularly allowed school age children to achieve considerable improvements in speed (Knappe, Mohns and Peters, 1968). Gleeson shows that the specific exercises to strengthen abdominal muscles during this period are possible, results obtained being better than in adolescence (Gleeson, 1986).

"IAAF has proposed the promotion of a new global policy regarding the category of children aged 7-15 years old, having as objectives: athletics, an individual sport, the most popular and practiced sport in a school environment, ensuring the widening of the selection basis in order to develop in long or short period of time a native reservoir of highly endowed athletes.

This policy of promoting athletics among young pupils aims at the following objectives:

- Promoting health through all the practical situations encountered during training, during competitions, encouraging children to practice athletics initially under the form of a game and then to become familiar step by step with elements of technique specific to athletics tests;
- Social interaction - Athletics, as a sport includes simple, natural movements which are part of the motor abilities of the children and that is why its practice from a young age represents a tool in integrating children in the school and social environment, facilitating a harmonious development from a psycho-motive and socio-affective perspective. All these aptitudes contribute to the plenary development of the grown-up.
- The valorization of the need for movement and the need for competition of the children, the creation of various situations, having an adventurous character meant to drive away boredom and lack of attention which might intervene in the process of training; this could be a way of attracting a great number of practitioners to sport, especially in athletics " (IAAF, 2002).

1.1. Purpose of the study

The purpose of the research was the elaboration and testing of some training models/samples in athletics for children aged 6-9 years old, an aim which helps experts face a new tendency in athlete training – early training – due to the changes in the national and international competitive calendar.

1.2 Hypothesis

The use of applicative routes and of relay races which have at the basis the athletic means ensuring a significant improvement of the basic motor qualities: speed, explosive force at children aged 6-9 years old.

2. Subjects and methods

2.1. Subjects

The experiment was based on testing children from classes with an athletics sports program at Comprehensive School No. 190 in Bucharest who have two classes per week lasting 90 minutes. 30 children aged 6-9 years old have been tested; the initial testing took place between 17-23 September, 2012, intermediary testing took place at the beginning of March 2013, and the final testing will take place at the end of the school year.
2.2. Materials and methods

The experiment used is at the level of findings; the motive tests used for hypothesis check were: 30-m running speed; standing long jump; vertical jump; sit-ups for 30 seconds;

Beginning with the IAAF objectives, we have elaborated a training programme adapted to the ante puberty age particularities, using applicative routes and relay races from athletics which is perfect according to the strong need of movement and competitions specific to age.

The statistical mathematics indicators used: indicators of the central tendency – arithmetic mean, indicators of scattering – standard deviation, variability coefficient, the “Student” test.

3. Findings and results

Results registered at the initial and intermediate testing are displayed in Table 1.

| Identified data | Initial measurements | Intermediate measurements |
|-----------------|----------------------|--------------------------|
| No. | cod | 30-m speed | Long jump | Vertical jump | Abd. 30 s | 30m speed | Long jump | Vertical jump | Abd. 30 s |
|     |     | sec | cm | cm | rep | sec | cm | cm | rep |
| 1   | N.S. | 5.96 | 158 | 22 | 24 | 5.71 | 163 | 30 | 29 |
| 2   | B.R. | 6.40 | 140 | 19 | 15 | 5.78 | 142 | 21 | 15 |
| 3   | Y.M. | 5.67 | 158 | 21 | 18 | 5.41 | 170 | 29 | 23 |
| 4   | H. T. | 5.61 | 142 | 26 | 32 | 5.29 | 153 | 30 | 32 |
| 5   | J. A.G. | 6.03 | 162 | 27 | 14 | 5.33 | 161 | 25 | 18 |
| 6   | P.E. | 5.69 | 160 | 23 | 20 | 5.37 | 155 | 25 | 20 |
| 7   | T.A. | 5.82 | 155 | 21 | 21 | 5.26 | 165 | 21 | 22 |
| 8   | J. A. | 5.91 | 151 | 22 | 21 | 5.61 | 151 | 25 | 25 |
| 9   | Z.A. | 6.23 | 120 | 10 | 17 | 6.05 | 135 | 13 | 25 |
| 10  | M.D.G. | 6.04 | 140 | 18 | 11 | 5.59 | 145 | 22 | 19 |
| 11  | I.C. | 5.11 | 158 | 27 | 22 | 5.05 | 165 | 33 | 30 |
| 12  | A.A | 5.47 | 138 | 25 | 17 | 5.12 | 160 | 24 | 24 |
| 13  | A.M | 5.36 | 155 | 26 | 23 | 5.23 | 165 | 27 | 27 |
| 14  | B.O | 5.31 | 148 | 28 | 31 | 5.09 | 162 | 28 | 33 |
| 15  | G.Ş. | 5.55 | 137 | 27 | 22 | 5.13 | 158 | 29 | 23 |
| 16  | P.A | 6.42 | 110 | 22 | 23 | 6.05 | 115 | 21 | 28 |
| 17  | F.F | 5.64 | 140 | 23 | 19 | 5.70 | 150 | 25 | 30 |
| 18  | C.A. | 5.70 | 140 | 32 | 18 | 5.37 | 139 | 32 | 19 |
| 19  | B.R. | 6.41 | 110 | 16 | 18 | 5.80 | 115 | 17 | 18 |
| 20  | G.A. | 6.36 | 105 | 17 | 15 | 6.12 | 129 | 19 | 18 |
| 21  | B.S. | 6.27 | 120 | 22 | 19 | 5.90 | 140 | 26 | 23 |
| 22  | G.D. | 5.81 | 130 | 17 | 16 | 5.26 | 148 | 17 | 20 |
Table 2 The statistical analysis of the 30 m running

| t bilateral TEST               | Statistics indicators          | Results          |
|-------------------------------|--------------------------------|-----------------|
| The level of fixed trust - α  | α = 0.05                       |                 |
| Null hypothesis H₀            | m₁ - m₂ = 0                    |                 |
| Alternative hypothesis H₁     | m₁ - m₂ ≠ 0                    |                 |
|                 | T critical (the value from the tables) | 1.699          |
| Liberty degrees - df          | 29                             |                 |
| Test result t                 | t calculated                   |                 |
|                               | 8.263                          |                 |

| Arithmetic mean | Median | Minimal value | Maximum value | Amplitude | Standard diverging | Variation coefficient (%) | Evolution of the arithmetic mean | The size of the effect (Cohen) |
|-----------------|--------|---------------|---------------|-----------|--------------------|--------------------------|-------------------------------|-----------------------------|
| 5.99            | 6.00   | 5.11          | 6.98          | 1.87      | 0.43               | 7.14                     | X                             | X                           |
| 5.69            | 5.71   | 5.05          | 6.80          | 1.75      | 0.45               | 7.87                     | -4.88                        | 1.51                        |

Al. Vit – 30-m running speed; S.L.L- At long jump from the standing; S. Vert.- At the vertical jump; Abd. 30’ - At the 30 minute sit ups testing
At the 30-m running speed, the value of the arithmetic mean at the initial testing is of 5.99 s, and the value at the intermediary testing is of 5.69 s. The necessary time for running has decreased averagely with 4.88% recording an absolute decrease of 0.3 s. The degree of scattering of the row values, represented by the standard diverting has values of 0.43 at the initial testing and the intermediary testing of 0.45. The variation coefficient has a value of 7.14% at the initial testing and of 7.87% at the intermediary test, indicating a slight decrease of the row homogeneousness, this keeping its value well. The test value „Student” calculated „t” between the initial testing and intermediary testing is of 8.263 being superior to the value of 1.699 from the table of Fischer and as a result, there are significant differences between the arithmetic means of the two tests. It is not allowed the hypothesis \( H_0 \).

At long jump from the standing the value of the arithmetic mean at the initial testing is of 137.13 cm, and the value at the intermediary testing is of 145.97 cm. The length of the jump has increased averagely with 6.44% recording an absolute increase of 8.84 cm. The degree of scattering of the row values, represented by the standard deviation, has values at the initial testing of 16.07 and at the intermediary testing of 15.59. The variation coefficient has the value of 11.72% at the initial test and of 10.68% at the intermediary test, indicating a slight increase of the row homogeneousness. The value of the test “Student” calculated „t” between the initial test and the intermediary test is of -5.803, being inferior to the value of 1.699 from the Fischer table and as a result, there are no significant differences between the means of the two tests. It is accepted the hypothesis \( H_0 \).

At the vertical jump the value of the arithmetic mean at the initial testing is of 21.47 cm, and the value at the intermediary test is of 23.93 cm. The length of the jump has increased averagely with 11.49% recording an absolute increase of 2.46 cm. The degree of scattering of the row values, represented by the standard deviation, has the values at the initial test of 4.53 and at the intermediary test of 4.59. The variation coefficient has the value of 21.11% at the initial testing and of 19.16% at the intermediary test, indicating a slight increase of the row homogeneousness. The value of the “Student” test calculated “t” between the initial testing and intermediary testing is of -5.258, being inferior to the value of 1.699 from the Fischer table and as a result there are no significant differences between the means of the two tests. It is accepted the hypothesis \( H_0 \).

At the 30 minute sit ups testing (ABD) the value of the arithmetic mean at the initial testing is of 20.20 repetitions, and the value at the intermediary testing is of 23.93 repetitions. The number of repetitions realized on subjects has increased in average with 18.48% recording an absolute increase of 3.73 repetitions. The degree of scattering of the row values, represented by the standard deviation, has the values at the initial testing of 4.47 and at the intermediary testing is of 4.58. The variation coefficient has the value of 22.12% at the initial testing and 19.13% at the intermediary testing, indicating an increase of the row homogeneousness. The value of the “Student” test calculated „t” between the initial testing and the intermediary testing is of -7081 being inferior to the value of 1.699 from the table of Fischer and as a result there are no significant differences between the means of the two tests and the hypothesis \( H_0 \) is accepted.
4. Conclusions

The formative program that was used has determined a significant improvement in the motor quality – speed, confirmed by the rejection of the null hypothesis for speed running; no significant differences have been noticed for the other tests applied, but one can notice that group homogeneousness has an increasing tendency (the coefficient of variation decreases), correlated with the change of amplitude, with special references to the SVV and ABD tests, in which the degree of homogeneousness is lower.

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