

CONTRIBUTIONS TO THE EVALUATION OF PHYSICAL TRAINING FOR STUDENTS SPECIALISED IN ALPINE SKIING

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Abstract: *The research approach consisted in the implementation of new tests in the physical training evaluation of the students from the Faculty of Physical Education and Mountain Sports from Braşov, in the third year of Bachelor in alpine skiing. The subjects of the research were ten students of FEFSM Braşov. The research activity took place during the 14 weeks of the first semester of the academic year 2018-2019. The objective was to participate and achieve good performances at the National University Ski & Snowboard Championship in 2019, slalom and giant slalom events. The initial testing was performed on October 5, 2018, and the final one on January 18, 2019. In the period between the tests, sports training programs were implemented that aimed primarily at developing speed motor quality in all its forms and coordination skills. The research results highlight both the progress of all subjects and the very good results obtained in the targeted ski events, national university champion titles and rankings among the top six places.*

Key words: *alpine skiing, physical test, evaluation, students.*

1. Introduction

This research approach aimed at introducing three new tests (two speed tests and an adapted Bass balance test) to assess the physical training of students of the Faculty of Physical Education and Mountain Sports in Brasov, in the third year of Bachelor in alpine skiing.

Alpine ski racing shows the technical nature of this sport, which requires both skill and motor control from the athletes

[10]. In addition to technique, alpine skiing requires all the physical abilities of an athlete, including strength (maximum strength, strength endurance and stability), power, aerobic and anaerobic capacity, balance, coordination and motor control and mobility [8], [4], [2]. The importance of developing coordinative skills in the sports training of alpine skiers with a focus on technical tests is also mentioned as the main objective [9].

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Sports' training has been shown to have a positive influence on body balance regardless the type of practiced sport [11]. In the opinion of a significant number of authors, a high level of balancing ability allows to obtain many benefits related to the improvement of sports performance [11], faster rehabilitation [12] and injury prevention [3], [6], [7]. All these considerations lead to the idea that specific balance training plays an essential role as it is stated in literature [10], [5].

2. Research Purpose

The aim was to identify new tests that can be used to develop a procedure for objectively assessing the fitness of alpine skiers involved in top domestic competitions and to update the methodological guidance in high performance training of students involved in alpine skiing.

3. Objectives

The proposed objectives were:

- the implementation of an objective evaluation methodology based on scientific research;
- adapting training programs to improve coordination and balance performance.

4. Hypothesis

We consider that, by implementing new tests in the direction of assessing the physical training of students participating in internal competitions, their results in these competitions will be significantly improved.

5. Material and Methods

Experimental approach to the problem

The study was designed to assess the implementation of new ways to test the level of development of skiers' coordination skills. All subjects were tested before and after a period of 14 weeks.

Subjects

The research was carried out on 10 male subjects - students in the third year, alpine skiing specialization of the Faculty of Physical Education and Mountain Sports, aged between 20 and 21 years.

The content of the research

The research was conducted in the academic year 2018-2019. The experimental method based on the pre-test = TI and post-test = TF model was chosen [1] to obtain a clear picture of the efficiency of the introduction of the three proposed tests.

The initial testing (TI) was performed on 05.10.2018. After that, during 14 weeks, sports training programs were implemented. They aimed primarily at developing the speed in all its forms of manifestation and the coordination skills, all these standing for the applied intervention which was made to assure a high level of coordination (dynamic balance, core stability), strength and speed.

The final testing (TF) was performed on 18.01.2019.

Test procedures:

1. Running test among the multi-coloured training cones, three-colour and four-colour themes:

Objectives of the test: verification of coordination, memory and reaction capacity.

Test description: The cones are placed as in figure 1. There are 5 lines with different coloured cones at 1m distance from each other. The finishing line is placed 50m from the start line. Two trials were allowed both for the 3-colour test and for the 4-colour test (total bypass 5 cones). Prior to execution, the subject received a note listing the colours of the cones to be bypassed (example for 3-

colour task: green, blue, red, red and for four-colour task: yellow, blue, blue, red, yellow). The other subjects were not allowed to watch the execution of the tested subject as they received the same tasks when it was their turn.

Test results: the time was measured.

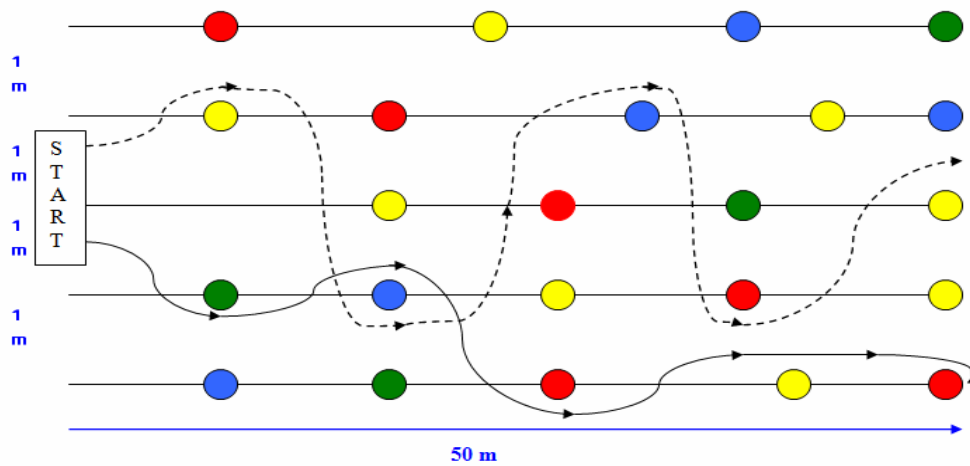


Fig. 1. Test 1 and 2 with training cones (Test 1- 3 colours THEME: green, blue, red, red; Test 2- 4 colours THEME: yellow, blue, blue, red, yellow)

Table 1

The norms for the running test among the multi-coloured training cones

Norms	30 pct	40 pct	50 pct	60 pct	70 pct	80 pct	90 pct	100 pct
3-colour theme test	11,4	11,2	11	10,8	10,6	10,4	10,2	10
4-colour theme test	12,2	12	11,8	11,6	11,4	11,2	11	10,8

2. Adapted BASS test of dynamic balance

Test objectives: checking balance, coordinating body segments, correct distribution of CGM.

Test description: Only one trial was performed. The adapted Bass test of dynamic balance requirement consisted of

side jumps on one lower limb and landing on the entire surface of the foot (sole), maintaining balance for five seconds in this static position, on the eleven marks of the route. There were awarded 5 points for each landing covering the mark and

one point for each second of maintaining the balance on the mark. [1].

The statistical analysis was performed using SPSS 26.0. The normality of the distribution of data was assessed through the Shapiro-Wilk test. Student's paired t-

test was used to test the significance between pre- and post-programmes to assess whether the intervention produced any modifications. The level of statistical significance was $p < 0.05$.

6. Results

TI and TF results in the three tests

Table 2

TESTS 1, 2 and 3	TI 3-colour T		TI 4-colour T		TF 3-colour T		TF 4-colour T		BASS TEST	
	sec	pct	sec	pct	sec	pct	sec	pct	TI pct	TF pct
Subject 1	11,2	40	11,9	45	10,8	60	11,6	60	78	84
Subject 2	11,3	35	11,9	45	11	50	11,7	55	83	85
Subject 3	10,8	60	11,7	55	10,7	65	11,3	75	86	91
Subject 4	10,5	75	11,4	70	10,4	80	11,2	80	87	83
Subject 5	11,4	30	11,8	50	10,6	70	11,7	55	85	86
Subject 6	11,1	45	11,6	60	10,7	65	11,4	70	89	97
Subject 7	10,7	65	11,5	65	10,4	80	11,7	55	93	98
Subject 8	10,9	55	11,6	60	10,6	70	11,5	65	76	84
Subject 9	10,8	60	11,3	65	10,5	75	11,4	70	80	91
Subject 10	10,5	75	11,1	85	10,1	95	11	90	94	99

7. Research Data Interpretation

Descriptive statistics for the three tests

Table 3

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Test initial Copete 3 Colours	54.0000	10	15.95131	5.04425
	Test final Copete 3 Colours	71.0000	10	12.42757	3.92994
Pair 2	Test initial Copete 4 Colours	60.0000	10	12.24745	3.87298
	Test final Copete 4 Colours	67.5000	10	11.84389	3.74537
Pair 3	Test Initial Bass	85.1000	10	6.00833	1.90000
	Test final Bass	89.8000	10	6.30344	1.99332

Correlation coefficient for the three tests

Table 4

		N	Correlation	Sig.
Pair 1	Test initial Copete 3 Colours & Test final Copete 3 Colours	10	.790	.007
Pair 2	Test initial Copete 4 Colours & Test final Copete 4 Colours	10	.785	.007
Pair 3	Test Initial Bass & Test final Bass	10	.766	.010

Student's t-test results for the three tests

Table 5

		Paired Differences		Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
		Mean	Std. Deviation		Lower	Upper			
Pair 1	Test initial Copete 3 Colours - Test final Copete 3 Colours	-17.00000	9.77525	3.09121	-23.99279	-10.00721	-5.499	9	.000
Pair 2	Test initial Copete 4 Colours - Test final Copete 4 Colours	-7.50000	7.90569	2.50000	-13.15539	-1.84461	-3.000	9	.015
Pair 3	Test Initial Bass - Test final Bass	-4.70000	4.21769	1.33375	-7.71715	-1.68285	-3.524	9	.006

The dependent sample or paired t-test showed that there are statistically significant differences in the final test TF compared to the initial test TI in each of the three proposed and applied tests: Test 1 – three-colour theme running test, Test 2 - four-colour theme running test and Test 3 – adapted Bass test of dynamic balance.

8. Conclusions

1. The research findings showed that the intervention on the 10 subjects materialized in the form of programmes for 14 weeks after the collection of the initial data on 05.10.2018 had effects on the group of students at the final test on

18.01.2019, the averages per pairs of tests increased significantly in the final tests.

2. For Test 1 – three-colour theme running test, $t(9) = 5,499$ $p = 0.00 < 0.05$.
3. For Test 2 – four-colour theme running test, $t(9) = 3$ $p = 0.015 < 0.05$.
4. For Test 3 – adapted Bass test of dynamic balance, $t(9) = 3,524$ $p = 0.006 < 0.05$.
5. Considering the comparative analysis of the scores of the three tests applied on the students group and their statistical significance, it can be considered that the implemented sports training programmes aiming primarily the developing speed motor quality in all its forms and coordination skills improved outcomes in final tests.

6. These findings, in their turn, determined the progress of all subjects from the studied group as well as very good results in the targeted competitions, national university champion titles and top 6 places in 2019, which confirms the research hypothesis.
7. The applied programmes on the students group were a success due to the obtained results and the way the subjects reacted to this research procedure.

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