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ORIGINAL ARTICLE

Expert model of the most important methodical exercises for fast skiing turns teaching

Danijela Kuna[1] ✉ • Sanjin Dzajic[2]• Marko Mastelic[1]

Abstract
The purpose of this research was to establish the expert model of learning and evaluation the most important methodical exercises for teaching short skiing turns in advanced skiing school. Participants were 20 skiing experts from different states. After the experts model was established, experts selected 5 most important methodical exercises for teaching short skiing turns. According to with the goal of the research, total frequency sum of expert choice of the most important methodical exercises has been used (O-observed; E-expected), while the difference between frequencies of expert evaluation has been tested by non-parametric Chi-square test (χ^2) and statistic meaning of differences (p). By natural selection, the ranking was made, and selection of the most important methodical exercises for teaching short skiing turns. After data processing, statistical differences were significant in frequencies in which experts choose most important methodical exercises (c2=17.30; p=0.14) while the differences between the values of most important methodical exercises were not established (c2=2.15; p=0.91). Statistical differences based on nationality were not established. Based on the obtained results it can be concluded that the experts in spite of the structural differences and specificity within each ski schools are equally recognized and valued those most important methodical exercises who contain the basic characteristics of effective lessons. This research is a foundation for future modeling which has made a selection of significant errors and exercises for their elimination, and their hierarchical classification.

Keywords expert model •ski demonstrators •short skiing turns

Introduction

The instruction of alpine skiers is a complex process conditioned by numerous endogenous and exogenous factors. Firstly, it depends on the specific mountain conditions in which it is performed, level of skiing foreknowledge, motivation and anthropological status of the subjects. In addition, it depends on the quality and the nature of the used skiing equipment, but mostly on the level of skiing education, experience and way of teaching used by skiing experts. Learning and performing specific skiing knowledge is a complex process that depends on the variable conditions of social environment. It can be defined as the process of systematic adoption and perfection of specific structure of dynamic movement, with the aim of efficient performance in various conditions and types of ski slopes. All the mentioned factors are the result of specific divisions and formations of different skiing school program models (Feinberg-Densmore, 2000; N. Jurković & D. Jurković, 2005; John, 2006; Murovec, 2006; Lešnik & Žvan, 2010). The skiing school programme enables and accelerates the process of acquiring skiing knowledge. The basis of the programme facilitates the adoption of various techniques of alpine skiing, and secures the gradual progress of skiing learning. In relation to the

✉ danijela.kuna@gmail.com

[1] University of Split, Faculty of Kinesiology, Croatia

[2] High school Konjic, Konjic, Bosnia and Herzegovina

mentioned and with the aim of rational performance and lower energy consumption, the skiing elements and methodological exercises should succeed one another in a logical methodological order. Good skiers have high level of specific skiing knowledge, what is recognised as the ability of successfully performing characteristic skiing elements, as well as conquering different kinds of snow terrains. Thus, they require lower levels of energy in order to perform any of these elements than skiers of lower knowledge level. High quality and professional help of teachers or trainers is the key factor in the process of acquiring and perfecting skiing knowledge. In order to secure adequate teaching, skiing teacher or trainer should have a high level of skiing knowledge and skills, and also understand methodologic and didactic principles of training process and the basis of psychological approach of working with people. Since human being is the subject, there is a great diversity among potential students, regarding the level and degree of anthropological abilities and characteristics they possess. Therefore, it is very important that skiing experts know and understand the dynamics of learning process of motor, that is, skiing knowledge, and that they apply the adequate teaching methods. Based on the research results (Kuna, 2012) that formed the expert model of the most important skiing elements of the advanced skiing school programme, among which fast skiing turns was present, an idea of forming the methodological procedures of their teaching occurred. In relation to the mentioned, the following research aims were set: a) forming the expert model of the most important methodical exercises for fast skiing turns teaching, b) determining the difference among skiing experts of different degree of skiing education.

Method

Elite skiing experts participated in the formation of the expert model of the most important methodological exercises for fast skiing turns. They were the representatives of Slovenian, Croatian and Bosnian-Herzegovinian skiing assistants, members of assistant teams with years-long skiing experience, education and experience in the work with the Alpine skiers of different levels of skiing foreknowledge. Twenty examinees were included in the research, of which 7 Croatian, 7 Slovenian and 6 Bosnian-Herzegovinian state skiing assistants.

The experts performed the multiple extraction of methodological exercises variables, in coordination with the author of the research, via e-mail. After defining and acquiring all the propositions of basic methodological exercises for fast skiing turns teaching, the expert model of fast skiing turns teaching was formed. After that, the task of examiners was to choose 5 most important methodological exercises for fast skiing turns teaching, forming an expert model of the most important methodological exercises for fast skiing turns teaching.

The sample of variables for fast skiing turns teaching consisted of 13 exercises (N=13): OTFT (one turn), PTHFST (parallel turn from hill into fast ski turn), FSTSD (fast ski turn in downhill slope), HOHFT (hands on hips), HOTFT (hands on thighs), AIFT (antenna imitation), ESPFT (extended ski poles), SPBB (ski poles behind back), SSPAT (switching ski poles around trunk), FTUSB (fast ski turns with unlaced ski boots), SBPUS (stabs of both ski poles under skis), IFTSB (imitation of fast ski turns in ski boots), FTWJ (fast ski turns with jumps).

With the aim of forming the expert model of the most important methodological exercises for fast skiing turns teaching, and the testing of the difference between the frequencies of expert choice, the following values were calculated: observed frequencies (OF) – total sum of expert choice amount frequency, expected frequencies (EF), non-parametric Hi – square test ($\chi 2$), and the corresponding empirical level of significance (p). With the aim of determining the hierarchical classification of the most important methodological exercises for fast skiing turns teaching, the following vales were calculated: range sum (ΣR) of variable range, Kruskal-Wallis test (H-test), and the corresponding empirical level of significance (p).

Results

Based on the obtained values of testing the statistical significance of differences between the frequencies of expert choice of 5 most important methodological exercises for fast skiing turns teaching ($c2=17.29$; $p=0.14$), it was observed that there was no statistically significant difference between the frequencies of expert choice of 5 most important methodological exercises. In other words, the formed model of methodological model for fast ski turns teaching included those exercises with specific

importance and contribution to the teaching alpine skiers, not singling them out on the statistically significant level. Model consisting of 5 most important methodological exercises for fast skiing turns teaching was formed based on the sum of the total frequency of expert choice.

Table 1. Frequencies of expert choice of 5 most important methodological exercises for fast skiing turns teaching

Methodological exercises of short skiing turn	OF	EF
OTFT	4	7.15
PTHFST	14	7.15
FSTSD	10	7.15
HOHFT	9	7.15
HOTFT	8	7.15
AIFT	10	7.15
ESPFT	7	7.15
SPBB	5	7.15
SSPAT	3	7.15
FTUSB	4	7.15
SBPUS	4	7.15
IFTSB	6	7.15
FTWJ	9	7.15
$\chi 2$= 17.29 p = 0.14		

Legend:
Observed frequencies (OF) – total sum of expert choice amount frequency, expected frequencies (EF), non-parametric Hi – square test ($\chi 2$), and the corresponding empirical level of significance (p)

The FPTHFST (parallel turn from hill into fast ski turn) methodological exercise had the highest level of importance. While performing the exercise the skier, after performing several parallel turns from the hill, shortens the radius of the turn, and emphasizes the sideways and axial movement of the body with minimal trunk rotation, passing into the dynamic skiing technique, performing fast skiing turns. In this way, he gradually adapts to the technical characteristics of the dynamic movement structures, characteristic of fast skiing turns. It is assumed that the gradation of acquiring and mastering main characteristics of the fast turns technique enabled by this methodological exercise were the main reason for classifying this exercise within the model of the most important. The second methodological exercise in this model is the FSTSD (fast ski turns in sloping downhill), where the skier performs fast turns in the slantwise direction downhill. This exercise is important because while performing fast turns in the slantwise direction downhill, the skier learns how to adjust regular diameters of turns, in relation to the slope degree. Besides this, the performance of one turn in relation to the other is facilitated, due to the slope degree, enabling better movement speed control and developing sense of rhythm and coordination. The third most important methodological exercise is HOHFT (hands on hips), where the skier learns the fast turns technique while holding his hands on hips. When performing this exercise the skier concentrates on the acquisition and harmonisation of characteristic skiing movements that influence the success of advancing and skis speed control, as well as the harmonious connection between several turns of regular circular shape. The fourth methodological exercise is the AIFT (antenna imitation) where the skier learns the fast turns technique holding the ski poles perpendicularly in extension. It is assumed that this exercise helps the skier to easily restore the still upper part of the body, in perpendicular positionregarding the line of movement. Because of the outstretched arms, the skier achieves and maintains the central position on the skis more easily, developing a sense of regular skis pressure control and coordination of skiing movement, by passing from one turn to another. The fifth methodological exercise within the expert model of the most important ones is the FTWJ (fast turns with jumps), where the skier, passing from one turn to another, performs a jump. The vertical, circular and sideways knee movements in turns are especially important for their efficient performance. In comparison with the remaining methodological exercises defined according to the expert model, FTWJ is the most complex exercise regarding the coordination, and therefore the skiing teachers

should know how to apply it in concordance with the possibilities and abilities of the athlete they train.

Inspection of the Hi square test values and the statistical significance indicators (Table 2) showed no difference among experts, regarding the nationality. In spite of structural difference that do exist in the actual programmes of Croatian, Slovenian and Bosnian-Herzegovinian school and the methods of fast turns teaching, the statistically significant differences in the choice of most important methodological exercises were not determined.

Table 2. Differences in the choice of most important methodological exercises for teaching fast skiing turns

Methodological exercises of short skiing turn	CRO	SLO	BIH	$\chi 2$	p
OTFT	0.86	2	1	0.60	0.74
PTHFST	5.14	3	5	0.66	0.72
FSTSD	3.43	2	4	0.68	0.71
HOHFT	2.57	3	3	0.04	0.98
HOTFT	2.57	2	3	0.20	0.91
AIFT	3.43	3	3	0.04	0.98
ESPFT	2.57	2	2	0.10	0.95
SPBB	0.86	3	1	1.77	0.41
SSPAT	0.86	2	0	2.11	0.35
FTUSB	0.86	2	1	0.60	0.74
SBPUS	0.86	2	1	0.60	0.74
IFTSB	2.57	2	1	0.68	0.71
FTWJ	1.71	2	5	2.28	0.32

Legend:
Observed corrected frequency of Croatian experts (CRO), observed corrected frequency of Slovenian experts (SLO), observed corrected frequency of Bosnian experts (BIH), non-parametric Hi – square test ($\chi 2$), and the corresponding empirical level of significance (p)

Based on this, it can be claimed that the expert group that can be characterised as homogeneous, disregarding the differences between skiing schools they represent, formed the expert model of the most important methodological exercises for fast turns training. By forming the expert model of methodological exercises for teaching fast turns, and by selecting the most important ones, we contribute to the better understanding of relations and defining basic methodological procedures in the alpine skiers teaching process. The results obtained in this research open up a possibility of conducting future research that could define the characteristic errors and the most efficient exercises for their correction, in the process of fast turns acquisition. In addition, a need for constructing measuring instruments occured, instruments that could enable higher selection quality, and the choice of training modality and training exercises in the process of educating alpine skiers of different ages and levels of skiing knowledge.

Discussion

Based on the acquaintance with the basic characteristics of motor learning, great practical and methodological knowledge while working with skiers of different skiing knowledge, 20 elite Croatian, Slovenian and Bosnian-Herzegovinian skiing experts first defined, and then evaluated the 5 most important methodological exercises that facilitate the acquisition of fast turns technique.

Based on the determined statistically significant differences between the frequencies of expert evaluation of the most important methodological exercises in teaching fast turns, the model of exercises that was distinguished by their importance and applicative value was identified. In spite of the structural differences and specificities of skiing schools that skiing experts represent, the differences between them were not determined.

It can be concluded that the examinees formed a homogeneous group in defining the dynamics and fast turns teaching process. The values of this paper

are the new and original research approach, which secured crucial information on the systematic mode of acquiring specific skiing knowledge. The information regarding the methodological laws on organising the fast ski turns process obtained through experiments are extremely important for the kinesiological practice of alpine skiing. This research opens the routs towards the future research that could detect characteristic errors, exercises for their correction and conduct empirical tests of the formed model on different samples of examinees.

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