

EXPERT MODEL FOR METHODICAL LEARNING OF SKIING WITH DIFFERENT RHYTHM AND PACE

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Original research:

Abstract

The purpose of the present study was to investigate the formation of an expert model of the most important operators for methodical learning of skiing with different rhythm and pace. In this particular research was conducted on 20 ski experts from different countries. The experts first defined a model of operators for methodical learning and then, on a scale from 1 to 5, selected the five most important exercises. Execution of ranking was defined by the sum of the frequencies of expert's values. In accordance with the research objective tests which are used were nonparametric chi - square test (χ^2) and statistical test of differences between expert ranks of most important operators and values of the most important ones. Differences were obtained in frequencies of expert selection of most important operators for methodical learning of skiing with different rhythm and pace ($\chi^2 = 24,03$; $p = 0,02$), and differences between values of most important ones ($\chi^2 = 575,70$; $p < 0,001$). The results of this research allow precise and science justified methodical innovations of expert model of skiing with different rhythm and pace. This research presents foundation for further hierarchical classification of expert model and defining of characteristic mistakes and correction exercises.

Key words: ski school, expert model, skiing with different rhythm and pace

Introduction

With analysis of many different sports research results, it is clear that skiing belongs to the order of complex alpine disciplines where outdoor conditions, have primary influence (Supej, 2020 et al.) where the primary influence during the acquisition of ski knowledge and performance have external conditions in which the teaching process takes place, age and specific motor skills of individuals, and only secondary motor - functional abilities, body composition, and others dimensions (Franjko, 2007., Supej, Spörri, Holmberg 2020).

Alpine skiing has been an Olympic sport since the first Winter Games in 1936 in Garmisch-Partenkirchen, Germany. After several years of top-level ski racing, it has led to skiers being able to constantly adapt themselves technically and tactically to snow conditions, gate setups, weather conditions and equipment (Supej 2020). In outdoor sports such as alpine skiing, valid and reliable assessment of performance in the field is essential, but, at the same time, quite challenging (Supej, Spörri, Holmberg 2020).

Educated ski instructors of alpine skiing with different levels of knowledge and experience are using specific

models of teaching, and they differentiate their teaching mutually with their previous skiing experience, active knowledge and teaching methods. Specifics of ski school programs occurs in differences between skiing nations, respectively in which country ski schools are founded. Most of the ski schools place greater emphasis on external factors to be different; however, the core product remains the same. Contemporary skiing instruction can be a source of differentiation; therefore, contemporary scientific findings of learning should be injected into the teaching methods. An important part of the product is the quality of the instruction (Gruber, Öztüren, Özdemir, 2018). Nevertheless, main goal of all ski schools is to facilitate process and secure high-quality and effective alpine skiing school program, which in fact means knowledge and effective use of relevant pedagogical and didactical laws of teaching. In addition, differences between ski experts and ski school programs are occurring in their levels of ski knowledge and practical application of methodical theory and practical aspects. In other words, for successive performing of every job, and so in process of ski teaching, it is essential to approach individual interests and capabilities of every attendant. In this context, injury prevention should also include the consideration of biological maturity status because late maturing athletes might be at a higher risk for both

overuse and traumatic injuries (Müller, et al., 2017). Additionally, many young athletes are disadvantaged in their career development because of the loss of training time due to severe injuries (Steidl-Müller et al., 2019). With respect of methodical progressive principal, process of ski teaching needs to be structured from easier exercises to difficult ones, which means difficult ski elements. In ski school programs around the World, beginner students are firstly being introduced to ski equipment, then with plunging ski techniques, after that with parallel technique and lastly with carving and other competitive ski disciplines/techniques. Variations in course setting, terrain, snow conditions, speed, and visibility all place very high demands on the skier's ability to adapt technique and tactics effectively (Gilgien, et. Al., 2018).

Skiing with different rhythm and pace is part of advanced ski school program within ski instructor course, according to Croatian alliance of winter sport teachers (HZUTS), and other associations from other countries. This particular element is manifested when skier, depending of his preferences and outdoor conditions executes turns of bigger or spaller radius, and combine various elements of ski technique. Skiing with different rhythm and pace in context of advanced ski instructor course is manifested through well-defined order of ski techniques with different rhythm and radius of turns.

This particular research has goal to construct expert model of teaching skiing with different rhythm and pace. In addition, there are two main goals: a) formation of an expert model of the most important operators for methodical learning of skiing with different rhythm and pace and b) hierarchical classification of expert model for five most effective operators for methodical learning of skiing with different rhythm and pace.

Methods

Participants and procedure of measurements

With the aim of creating model of most important operators for methodical learning of skiing with different rhythm and pace, research is conducted in cooperation with twenty ski experts. Expert group consists of seven Croatian, seven Slovenian and six Bosnian and Herzegovina country demonstrators, members of demo team, who voluntary accepted to be a part of research, respectively in construction of methodical settings for learning of skiing with different rhythm and pace. Research was conducted through electronic communication, and after hours of extraction of operators in combination with executions of skiing with different rhythm and pace, experts introduced model for methodical learning of listed

element. Proposed expert model for methodical learning of skiing with different rhythm and pace which is often used in teaching of advance skiers is constructed with following operators: KZBBV (combination of ski turns to the hill and fast wiggles), KOZBV (combination of elementary ski turn and fast wiggles), KPZBV (combination of parallel ski turn to the hill and fast wiggles), KBVPZB (combination of fast wiggles and parallel ski turns from the hill), KBVDPZ (combination of fast wiggles and dynamic parallel ski turn), KDPZBV (combination of dynamic parallel ski turn and fast wiggles), KDPZPZBBV (combination of dynamic parallel ski turn from the hill, parallel ski turn and fast wiggles), TBV 3:3:1 (rhythm of fast wiggles), TDPZ 3:3:1 (rhythm of dynamic parallel ski turn), TDPZBV 3:5:1 (rhythm of dynamic parallel ski turn and fast wiggles), TBVDP 3:3:5 (rhythm of fast wiggles and dynamic parallel ski turn), TBV 3:3 (rhythm of fast wiggles).

Statistical analysis

In harmony with previously defined goals of research, forming of expert model for methodical teaching of skiing with different rhythm and pace, nonparametric Chi-Square test (χ^2) was used. Statistical difference (p) was tested between frequencies of expert selection of five most important methodical operators for learning of skiing with different rhythm and pace, and in continuation, according to overall results of frequencies of expert selection, most important ones were defined.

Results and Discussion

Frequencies of expert evaluation for five most important methodical operators for teaching of skiing with different rhythm and pace are represented in Table 1.

Based on presented results there is statistically significant difference between frequencies of values for specific operators ($\chi^2=24,03$; $p=0,02$).

Largest frequency of expert evaluation for teaching skiing with different rhythm and pace has operator *KDPZBV* (combination of dynamic parallel ski turn and fast wiggles) where skier after few dynamic parallel turns crossing into technic of fast wiggles, which represents combination of most attractive elements of advanced ski school. In those elements' skier has to have high level of ski knowledge, experience and automatization of execution.

Following operators according to expert evaluation results are *KDPZPZBIBV* (combination of dynamic parallel ski turn, parallel ski turns from hill and fast wiggles) and *KPZBV* (combination of parallel ski turn from hill and fast wiggles). In *KDPZPZBIBV* exercise

during execution of larger amount of ski turns skier combines three ski techniques which are integral element of advanced ski school program, and precondition for that is skier's high automatization level of adopted practical ski knowledge. On the third place of operators in context of importance during teaching of skiing with different rhythm and pace is exercise *KPZBV (combination of parallel ski turn from hill and fast wriggles)*.

Value of this operator is apparent in multi-applicative role because of combination that consists of two most difficult ski element sin aspects of coordination. This methodical exercise is first manifested on the light inclinations of ski slope, and after on steeper ski slopes. Last two operators who belong to expert model of five most important methodical exercises for skiing

Table 1. Observed (OP) and expected (OČ) frequencies of expert evaluation for most important operators in teaching of skiing with different rhythm and pace, Chi-square test value (χ^2) and significance level (p).

Operators for skiing with different rhythm and pace	OP	OČ
KZBBV	5	7,69
KOZBV	9	7,69
KPZBV	12	7,69
KBVPZB	7	7,69
KBVDPZ	8	7,69
KDPZBV	15	7,69
KDPZPZBBV	13	7,69
TBV 3:3:1	6	7,69
TDPZ 3:3:1	4	7,69
TDPZBV 3:5:1	10	7,69
TBVDP 3:3:5	5	7,69
TBV 3:3	4	7,69
$\chi^2= 24.03; p = 0.02$		

Legend: OP – observed frequencies of expert evaluation for most important methodical exercises,

OČ - expected frequencies of expert evaluation for most important methodical exercises,

χ^2 - Chi-square test value, p- significance level.

with different rhythm and pace according to their frequency values are *TDPZIBV 3:5:1 (rhythm of dynamic parallel ski turn and fast wriggles)* i *KOZBV (combination of elementary ski turn and fast wriggles)*. *TDPZIBV 3:5:1* Operator with specified rhythm of combining dynamic parallel ski turns and fast wriggles is executed under specified rhythm scheme and specified number of ski turns. It is best way to recognize skier's ability to control speed and course, and overall specific coordination which is precondition for execution of this operator.

In combination of elementary ski turns and technic of fast wriggling, main parts of elements from elementary and advanced ski school are present, which makes

main value and originality of this operator. Successful execution of this element is conditioned with wide ski knowledge and high level of acquisition which mean high amount of automatization for certain elements.

Conclusion

Skiing with different rhythm and pace is one of most utilitarian ski elements because with that method skier have maximum control on his own movement. With use of this element skier eliminates possibility of terrain to dictate rhythm of skiing, and throw out skier from race, apropos hurts him. Knowing this element represents certain secure and independence on track, and of course on non-settled slopes/hills, which means that every skier, recreative or competitive should master this element in purpose of self-safeness and safeness of other skiers on track. Presented results of this research enable precise and science approved methodical innovation of expert model of skiing with different rhythm and pace. Model which is presented above is applicative in all ski schools, independent of country and climate where is used, and that represents high utility within alpine ski schools generally. Ski instructors and teachers gained exact and precise, but still simple scheme of methodical approach to students in process of teaching to skiing with different rhythm and pace, which leads to faster and simpler way of learning, and raising percentage of success. Presented research represents contribution to production of complete hierarchical classification of methodical approach in ski school programs around the country, Europe and World.

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