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Ski Training and Orienting in a Module-Based Program of Physical Culture and Sports

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Abstract. Together with the general health care, the training classes in Physical Culture and Sports for non-majors should focus on personal self-fulfillment thorough various forms of physical culture and sports. This has always been in the universities' academic plans, and the current State Educational Standard (3++), which provides with 400 academic hours for Physical Culture and Sports, is not an exception. These days, the outdoor classes for students are more relevant than ever against the background of the ongoing COVID-19 and restrictive social and sanitary measures (social distance). This work presents a module-base program and methodological support of teaching within the framework of Physical Culture and Sports discipline, including ski training, orienteering and general physical training. Each training module, which includes 8–13 comprehensive classes, is designed to implement an independent part of educational material following specific natural and climatic conditions. Its usefulness is tested through a pedagogical experiment on the students of Polytechnic School, Siberian Federal University.

Keywords: orienting, ski training, general physical training, program for Physical Culture and Sports, methodological modules

Research area: theory and methodology of physical education, sport training, recreational and adapted physical education

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Лыжная подготовка и спортивное ориентирование в блоковой программе учебной дисциплины «Физическая культура и спорт»

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Аннотация. Цель учебных занятий по дисциплине «Физическая культура и спорт» для студентов нефизкультурных специальностей наряду с общим оздоровительным эффектом должна учитывать направленность на личностную самореализацию в разных формах физкультурно-спортивной практики. Это всегда находило отражение в программах обучения вузов, включая и ныне действующий Государственный образовательный стандарт третьего поколения, предусматривающий 400 академических часов для освоения программы учебной дисциплины «Физическая культура и спорт». Сегодня как никогда актуальны занятия для студентов на открытых пространствах на фоне продолжающейся эпидемии и ограничительных мер, вводимых для обеспечения безопасного расстояния между занимающимися по санитарным нормам. В данном исследовании представлено блоковое программно-методическое обеспечение учебного процесса в рамках общего курса дисциплины «Физическая культура и спорт», включающее лыжную подготовку, спортивное ориентирование и общую физическую подготовку. Каждый учебный блок, включающий 8–13 однонаправленных занятий, предназначен для реализации автономной доли учебного материала в соответствии с конкретными природно-климатическими условиями. Его эффективность подтверждена проведенным педагогическим экспериментом в учебном процессе студентов политехнического института СФУ.

Ключевые слова: спортивное ориентирование, лыжная подготовка, общая физическая подготовка, программа дисциплины «Физическая культура и спорт», методические блоки.

Научная специальность: 5.8.4 – физическая культура и профессиональная физическая подготовка; 5.8.5 – теория и методика спорта.

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Introduction

As a compulsory subject within physical education at universities, the training program was accepted as early as 1929 by the Decree of the Council of People's Commissars of the RSFSR, and that time, this task was a responsibility of the reserve-officer training departments with

a focus on first-, and second-year students (Stolbov, Finogenova, Melnikova, 2002). The subject-oriented physical training programs did not appear until 1931, and since that, were slowly refocusing from military targets to health improvement, inclusive self-development and physical capability of students. When in 1933

the first course program for technical universities was admitted, its biggest part was based on the *Ready for Work and Defense of the USSR* complex; at the same time, in many regions, the academic program included gymnastics, ski training and swimming (Kuramshin, 2014). In the post-war period, after the departments of military and physical education had been divided, ski training remained in the main part of *physical education* as an academic discipline (Khomichev, Artemiev, Levina, 2016).

In Russia, since the late 20th century, the course programs on physical education have crossed over to personal self-fulfillment in various physical practices and cultural assets (Lubysheva, 2015; Maslov, Kravchuk, 2016). In 1990s, in the State Educational Standards of Higher Professional Education (GOS VPO), the humanities also included *Physical culture*, as an obligatory academic course of 408 educational hours over the whole educational period. Since 1995, in many educational institutions, there has been 4 hours: there were either two classes per week during the first three years, or three classes per week during the first two years of post-school education. The document established a basis and functioned as a standard regulation developing physical culture and sports at universities (Chistyakov, Davidenko, Grigoriev, 2011). Alongside with mastering practical and motor skills, the discipline targeted the knowledge of how to use these skills independently in other physical and health-improving activities (Bochkareva, Vysotskaya, Rostevanov, 2017; Kuleshova, Rumba, Gorelov, 2016; Musina and Egorycheva, 2006).

As the first Standard was designed for the specialist's degree, after 2017 it has suffered changes to become convenient for Bachelor's programs and the Federal State Educational Standard of 3rd Generation (3++). The later provides with 400 academic hours for *Physical culture and Sport* (Kalganova, 2014). In Siberian Federal University, this academic discipline covers the education period from 1st to 3rd years, with two lessons weekly.

Following the course scheme, the students are expected to capture the means of physical culture to improve their health by exercising any sport activity sports. Currently, the facilities

and resources for physical education in Russian universities are being constantly upgraded, and thus, the number of sports developed and offered to students is growing (Vlasov, Vorobieva, Tsyrenov, 2019). All this are additional opportunities for being engaged in sport to meet one's physical culture demands, that, in turn, always encourages for physical activity in the classroom (Utkin, Revenko, Salnikov, 2010; Fedorov, 2010; Shilko, 2002).

This study considers an idea of engaging the student into outdoor sport activities as a part of educational process. It turns to be practically important against the COVID-19 and restrictive measures introduced to ensure the social safety distance between people. Yet, due to the snow cover which remains over the longest part of the academic year, the most common outdoor sport is skiing (Butin, 2000; Zhdankina, Dobrynin, 2017). Ski training are given by short training circles near the ski lodges, which many universities of Central Russia, Urals, Siberia and Far East either own or rent. If there is no snow, in the beginning and in the end of the academic year, then the cross-country runs for different distances, combined developing and muscle-building exercises step forward (Shulgin, 2001). In education, these physical activities are also important, as they determine the general physical training of students, where the development and testing of physical status is necessary, i.e. speed, endurance, strength, flexibility. These features are personal inborn morphological and functional potential, which reflects one's motor capability of different nature (Ponomarev, Kuvanov, Selyukin, 2019).

Still, even in this part of the academic year, the students are more attracted to specific sports. Thus, for example, orienteering most harmoniously accompanies the training on ski lodges (Kohergin, 2006; Korobeynikova, Lukyanova, 2008; Sevastyanov, Kulikov, 2014). Compared to cross-country skiing, this sport is young enough, but has already gained popularity in the students in tens of Russia's regions and in other countries as well (Jourand, Adé, Sève, Komar, Thouvarecq, 2018; Mottet, Eccles, Saury, 2016). In this case, to work out the classes, one needs a sports map, which is now available, since in most regions they have

already been posted near the universities' ski lodges. At its core, orienteering means covering a specific distance, mapped by circles and lines, and along the route, at special landmarks, the teacher ticks checkpoints. When covering the distance, the students demonstrate their thinking manner, develop imagination and memory, supported by physical activity – running or walking (Bliznevskaya, 2006; Petrovic, 2014). Simultaneously, it is necessary to constantly switch attention from the map to the path, which works for mastering the psychomotor skills and a gradual increase of memorized elements (Bolotin, Silchuk, Shchedrin, 2009; Zentai, 2014). Moreover, such cartographic training is quite instrumental for many specialists, e.g., geologists, agronomists, land surveyors, geodesists, as well as construction engineers of roads, gas pipelines, and power lines (Voronov, Sevastyanov, 2015; Mikhailovsky, Gromov, Kovalenko, 2020).

Recent trends in the management of *physical culture* necessitate a diversity, including the outdoor classes (Gladyshev, Gladysheva, Klimova, 2018; Izotov, Soldatova, Filatov, 2018). Therefore, the question is how to plan the training sessions effectively and harmoniously, relying on two sports and involving some general physical training. Given that, this study aims outlining an efficient module-based scheme for *Physical Culture and Sport*, in ski training and orienting for non-majors.

Results and discussion

To enhance the applicability of ski training and orienteering in simultaneous mastering the technique and general endurance development, there now is a module-based methodological guideline as part of *Physical Culture and Sports* (Fig. 1). In this sphere, educational and methodological modules are spread enough, as practical mesocycles of single classes, which focus on general period of education, targeting an objective development of certain skills (Kuznetsov, 2012). Although in the module-based programs some blocks are methodologically independent, their maturity, harmony and synchronicity are also required to achieve the final goal. Indeed, the training toolkit there should be carefully streamlined and structured.

To create such system, applying to skiing and orienteering, one should regard the natural and climatic data throughout the academic year. Regarding the practice of training sessions at ski lodges, there is a module-based program of three parts:

- 1 module includes general acquiring and mastering different techniques in orienteering; this module should be passed during a snowless period (September/early October; late April/May);

- 2 module includes physical qualities improvement for further *Ready for Work and Defense* tests, carried out in the off-season, before thick snow cover and after it (late October/early November, late March / early April);

- 3 module includes mastering classic skiing and is carried out during the snowy stage of training (late November/ early March, except for the term exams and holidays).

The figure shows how the above methodological modules are placed in the academic plan, regarding the logic and deadlines; besides it marks specific methodological tasks, and phase targets of the academic course. This training program in *Physical Culture and Sports* for the non-majors has been tested through a pedagogical experiment, introduced into learning processes in Polytechnic School, Siberian Federal University, Krasnoyarsk; the data, further, have been analyzed on usefulness. Experimental (boys n=20, girls n=20) and control (boys n=20, girls n=20) groups were second-year students, already engaged in ski training during their first year of study, and judging by their medical records, were recommended for general or reduced physical exercise load. These groups were open on the awareness, comparative, and the classes followed the table, with all expected 68 sessions during the academic year.

When training, both groups kept to the general Bachelor's curriculum of the discipline, but were specified by the programs: the experimental group was trained through the module-based structure, while the control group used the classical one, popular in students engaged in ski training only. The main differences were that, in the early academic year, the control group took up preparatory imitation exercises for skiers, and the exper-

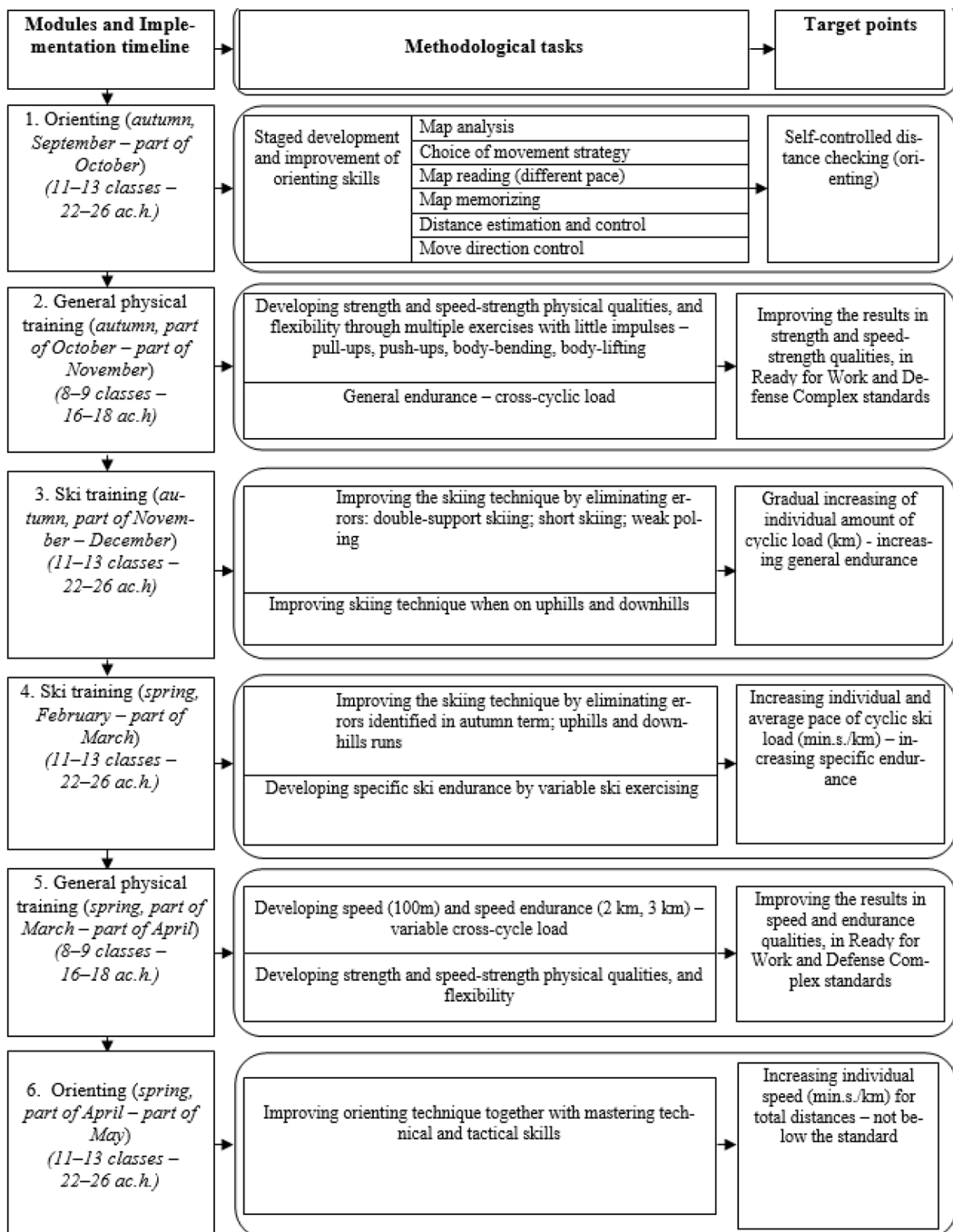


Fig. 1. Modules in Physical Culture and Sport: ski training, orienting, and general physical training

imental group – mastering the technique of cross-country orienteering. As for such physical qualities as strength and flexibility, so, in the control group, their improvement was

always a part of combined classes and was random throughout the academic year; in the experimental group, such physical loads stay in autumn training module, then in spring, for

8–9 classes. In the main part of each class, the exercises were performed by multiple repetitions with little impulses, i.e. 30–40 % of expected maximum. The methodological tasks were slightly changed, when the elimination of only three gross errors in the cycle (3rd module), became crucial. As a result, the number of possible pauses for technique error-correcting, which is not decisive for recreational skiing, was significantly reduced.

Thus, the greatest result of the module-based program is a growing interest in physical classes, followed by growing attendance rates. In this sense, on average, it has increased: in the experimental group – from 74.56 ± 3.78 to 88.24 ± 4.62 (autumn), and from 76.23 ± 4.15 to 89.15 ± 4.44 (spring), which indicates statistical accuracy of the parameters ($p < 0.05$); in the control group, there has been no significant changes: from 74.34 ± 3.26 to 75.86 ± 3.05 (autumn), from 76.50 ± 4.48 to 77.28 ± 3.77 (spring).

Also statistically, as for the amount of the ski load in the 3rd and 4th modules, it has also significantly increased only in the experimental group. For example, the average amount of cyclic load in the control group (boys) has changed from 4.1 ± 0.36 to 4.3 ± 0.32 (km/class) in spring, that is, by almost 200 meters, and

in the experimental group – from 4.2 ± 0.30 to 5.4 ± 0.38 (boys, for more than 1 km); similar situation is the control and experimental groups of girls.

Due to such growth of strength indicators, evident from almost every session (Table 1), there is an increasing motivation in attending the classes more regularly, even in the off-season. The results in Table 1 are of 2nd and 5th modules of the training program.

Conclusion

The proposed flexible approach to mastering methodological and practical skills for skiing and orienteering, as well as to the development of physical qualities through general physical training, driven by the module-based training implanted into the educational process, has positively changed the quality of classes, emotional background, and attendance rates. This is especially true in the last 2–3 years, when there is an urgent need to use open spaces for *Physical Culture and Sports* classes. Moreover, it creates plenty of choices for sports designed to form the students' physical culture, regarding new approaches to reforming the system of physical education with an eye on natural and climatic conditions.

Table 1. Physical fitness of boys (control and experimental groups), with ski training in *Physical Culture and Sports* (before and after the experiment)

Tests	CG (n=20)		EG (n=20)		t p	
	M±m before.	M±m after.	M±m before.	M±m after.	1–3	2–4
	1	2	3	4		
1. Modified pull-ups (number)	6,9±2,25	7,1±1,12	6,8±2,07	10,9±1,16	t=0,23 p>0,05	t=2,11 p≤0,05
	t=0,68 p>0,05		t=2,19 p≤0,05			
2. Bending with knees straight, standing on bench (down the bench level, cm)	10,4±1,28	11,0±1,24	10,3±1,32	11,8±1,44	t=0,28 p>0,05	t=0,96 p>0,05
	t=0,62 p>0,05		t=1,48 p>0,05			
3. Standing long jump (cm)	208,6±3,18	213,9±2,04	208,2±3,65	227,4±1,96	t=0,24 p>0,05	t=2,10 p≤0,05
	t=0,74 p>0,05		t=2,14 p≤0,05			
4. Sit-ups (number/ 1 min)	26,7±1,24	28,3±0,94	27,0±1,26	38,8±1,09	t=0,28 p>0,05	t=2,14 p≤0,05

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