

## BASICS OF PROGRAMMING EXERCISES USING HEALTH AND FITNESS TECHNOLOGY IN PHYSICAL EDUCATION PUPILS OF SECONDARY SCHOOLS

Verkhovska M.V.

Oles Honchar Dnipropetrovsk National University

**Annotation.** *Purpose:* to present a framework for programming model classes using athletic health technologies at physical training lessons to pupils of general education schools. *Material:* the information base on research constitute official documents of the governing bodies of the European Union for the development of sports education. Also - the curricula and training programs for teachers of physical training, training programs on physical training of general educational institutions, research papers, reference and encyclopaedias, periodicals, national and foreign publications. The study involved 178 teachers of physical culture. *Results:* The general education schools were given the right choice of the existing options of training and education. Also - the construction of new ones. Therefore, the logical focus is physical education teachers to use technology in improving physical fitness training lessons, changing the concept of sports orientation of physical training on wellness. This concept aims at developing various curricula, development and testing of new technologies and more. *Conclusions:* Programming exercises using athletic health technologies do not change the logic of the training and educational process. They cancel stringent regulatory and authoritarian school programs, form the subject of a positive motivation to contribute to improving and training effect, adjust the health status of all participants.

**Keywords:** physical culture, health, technology, software, activity, lesson.

### Introduction

In society there is no such phenomenon, which would be more multifold and dialectic than school. School is an institution, which is passed through by all Ukrainian population, independent on status, nationality or religion. Further intensification and complication of school teaching process requires from pupils to demonstrate higher psychic and physical efforts. One of main directions of comprehensive school's work is health related activity. Care of physical health, formation of mental and physical qualities are the tasks of physical culture. Comprehensive educational institutions received right to choose from existing variants of teaching and education, to construct new variants of curriculums and academic programs, to work out and test new technologies. In physical culture it means implementation of health related technologies.

Thus, in spite of numerous innovations, in practice, existing in schools physical culture programs are full of not popular kinds of sports and oriented on military-applied and sport fitness, which require certain level of physical conditions with insufficient quantity of academic hours for this. Quantity of hour in a week is restricted; parents' Committees shorten quantity of physical culture lessons because of mortal cases at physical culture lessons. All this facilitate negative dynamic of rising generation's health. Very low health level of pre-conscription and conscription age youth is a challenge to political situation, which now exists in Ukraine. For modern children with their actual health condition health related trainings are necessary, because they facilitate harmonious development of physical qualities and functional potentials of organism.

The topic of this research complies with topical plan of scientific researches "Renewal of conceptual principles of Ukrainian vocational education at stage of Euro-integration" (state registration number 0109U002114).

### Purpose, tasks, methods and material of the research

*The purpose of the work* is determination and foundation of programming of classes with application of health related technologies.

*The tasks of the research* are analyzing of scientific and scientific-methodic literature, observations over master classes with application of health related technologies in period from 2001 to 2014. Besides, it was necessary to determine on what principles classes with application of health related technologies are programmed.

*The methods of the research:* analysis of documents and literature sources (documents of governing board of European Union about development of physical culture education, standards of teachers' training, academic programs on physical culture for comprehensive schools, materials of scientific conferences, monographs, dissertations, article, reference literature, periodicals and foreign publications). We attended about 100 of practical master-classes on international health-related conventions in period from 2001 to 2014. Statistical data for pilot experiment, in which 178 physical culture teachers from Melitopol and Dniepropetrovsk participated, facilitated qualitative-quantitative analysis of readiness to apply health related technologies at physical culture lessons. Respondents' status was approximately equal. All they were teachers of physical culture of age from 24 to 48 years; 55.05% of women and 44.95% of men. All they had special or higher education. All they answered the questions of questionnaire "Diagnostic methodic of determination of teacher's readiness for application of health related technologies in professional activity".

### Results of the research

Analysis of documents and literature sources, observation of practical master-classes of international health related conventions resulted in definition that “health related technology is a synthesis of up-to-date, scientifically grounded health related means, which are used in physical education; besides, it includes special knowledge, practical experience of realization of innovative forms of physical exercises and innovative psychological-pedagogic approaches to ensuring of motion functioning for harmonious, first of all physical, development, considering sex and age specificities, their motivations, with the help of modern sport equipment and means of control and monitoring”. Distinctive feature of health related technologies is that their main mean is practical physical exercises and orientation of harmonious physical development, increasing of motion activity, rising of organism’s functional potentials.

Nowadays, scientists are seeking for new approaches to constructing of health related programs for increasing of physical education’s effectiveness [4, 11]; they determine more efficient forms of organization of schoolchildren’s functioning, search methods and means, which would activate schoolchildren’s interest to physical culture trainings and form demand in independent trainings [3, 5, 9, 12, 13]; solve problems of motion regimes’ optimization, improvement of physical fitness, dosing of physical load, considering psycho-physiological, typological and social characteristics of pupils [6, 7, 8, 10].

Summarizing of pilot experiment permits to mark out key aspects, which concern application of health related technologies. 73.03% of physical culture teacher have great interest to these technologies and wish to apply them. But nevertheless, traditional forms of trainings: outdoor games, track and field events, swimming, gymnastic are the most popular among physical culture teachers. From non-traditional forms, which are envisaged by academic program, we can mention: trainings on simulators, choreography. The less popular are crosses, skiing. Step-aerobic, which appeared in school curriculum not long ago and is applied now not very often, because it requires special equipment, collected the most quantity of voices. Teachers like simulators, trainings with fit-balls, aqua-aerobic; some teachers noted yoga and pilates.

From the questioned teachers 91.56% are able to conduct lessons with application of traditional physical education methods in frames of school program and 10.12% can conduct lessons with application of health related technologies; 10.67% of teachers are able to construct programs with application of health related technologies. Level of knowledge of conducting physical education lessons with application of traditional means is 70.32%. Level of knowledge of conducting physical education lessons with application of traditional means is Level of knowledge of conducting physical education lessons with application of health related technologies is 5,13%. Level of skills of conducting physical education lessons with application of traditional means is 71,93%, Level of skills of conducting physical education lessons with application of health related technologies is 7,18%. 24.72% of respondent pointed that negative reasons of implementation of health related technologies in comprehensive schools’ curriculums are insufficient knowledge, skills in application of health related technologies; 23.60% pointed at absence or deficit appropriate equipment; 14.60%; pointed at insufficient material provision; 8.43% - at not compliance of lessons with hygienic standards; 3.37% at insufficient level of medical control over pupils’ condition. It was determined that for boys the most popular were outdoor games, martial arts and trainings on simulators; for girls – step-aerobic, martial arts, outdoor games. The kinds of motion functioning of priority did not include kinds of sports (except outdoor games), which were the basis of physical culture course in school. Pupils also pointed that they would eagerly practice fit-ball gymnastic, yoga, pilates.

Specific features of physical culture teachers’ functioning are conditioned, first of all, by specificity of classes’ conducting. It is of common knowledge that lesson is the main form of organization of children’s physical education at school. In our pedagogic research conception “lesson with application of health related technologies” and “training with application of health related technologies” are identical and supplements each other. Time and place of programs is conditioned by curriculum, which is to be worked out by educational establishment. Health related training in system of trainings or as a component of physical education lessons’ cycle is relatively independent link, which is connected in certain sequence with other links of the same significance.

With programming of health related trainings general regularities of movements’ trainings and physical qualities’ development shall be considered as well as peculiarities of children’s contingent. In pedagogic aspect health related trainings are the forms of health related technologies.

Variety of health related trainings does not mean freedom of their construction; application of different kinds of motion functioning shall comply with main principles of physical education, because (in our case it is physical culture lesson) it is based on some laws (biological, pedagogic, psychological), which, in their turn, are formed in principles. They have much in common with didactic principles and principles of sport trainings, which are worked out in elite sports.

If to classify health related trainings by orientation of physical loads the, as on to day, there are three kinds of health related programs. In first of them it is envisaged to apply exercises of aerobic character, fulfilled in continuous way. By data of literature sources [1, 2] aerobic exercises are preferred. In other case trainings power and speed power exercises is practiced with rest interval of the same duration as load periods. Such training are conducted by circular method.. In third case programs use complex approach, which stipulated different methodic of different exercises. We offer the forth case: author’s method of training after monitoring of diagnostic of trainings cycle, which permits to determine what physical quality is in insufficient condition. Programming of trainings with application of health related technologies permits to program all parts of training according to set purpose.

The structure of health related physical culture lesson includes the following components: warming up, aerobic part, power part, flexibility training, final part. The necessary condition of health related training is medical-pedagogic control. Compulsory condition of trainings' cycle with application of health related technologies is monitoring of physical qualities' development. Purpose of of trainings is realization of optimal physical development, comprehensive perfection of physical qualities in combination with education of spiritual and moral qualities; that is why variety of movements is rather high. In table 1 we can see classification of physical exercises, but this picture is not complete and requires its improvement.

Table 1

*Classification of physical exercises at trainings with application of health related technologies*

PHYSICAL EXERCISES			
	GYMNASTIC	EXERCISES WITH OBJECTS, WITH EQUIPMENT, ON SIMULATORS, IN SWIMMING POOL	CHOREOGRAPHIC
IDEOMOTORIC	<i>BY ANATOMIC CHARACTERISTICS:</i> For upper limbs For upper limbs and girdle For girdle For girdle and back For neck For torso for abdomen muscles for pelvis floor muscles for lower limbs	WITH APPARATUSES AND OBJECTS (step-platforms, dumbbells, medical balls, rubber bands, etc.)	CLASSIC CHOREOGRAPHY EXERCISES
		ON SIMULATORS: Cardio-simulators power simulators	DANCING EXERCISES AND MOVEMENTS (modern directions, oriental, Latin-American, hip-hop and so on).
	<i>BY CHARACTER:</i> Breathing (static and dynamic) Serial Preparatory Correcting For balance For coordination Exercises with resistance Hangings and rests Jumping Stretching exercise Relaxation exercises	WITH OBJECTS, IN SWIMMING POOL (noodles, water dumbbells and so on).	
	<i>DYNAMIC (ISOTONIC):</i> Active Passive		
	<i>STATIC (ISOMETRIC)</i>		

Correlation of intensity and duration of exercises, used in health related trainings, are interdependent. The higher intensity is the lower is duration of exercise; the higher is intensity of general load at training, the lower is its duration [14, 15]. Health related effect is received first of all owing to orientation and dosing of exercises but not owing to their structure.

Load's dosing is change of load's scope and intensity. Advanced specialists in field of physical culture and sports determined factors, basing on which dosing of exercises at health related trainings shall be realized: rational parameters of temp, orientation, quantity of exercises' repetitions, connection of amplitude with temp and coordination complexity, depending on age and functional state of trainees. One of the most important factors of load's dosing at physical culture lessons with application of health related technologies is its distribution in the frames of one training.

On the base of analysis of literature sources, observations, domestic and foreign experience health related programs and trainings can be classified by four directions (see table 2):

- The most frequently used are programs, which are based on application of aerobic movements;
- Health related programs and trainings of anaerobic character with power exercises;
- Health related programs and trainings of health related-recreational orientation - «mind&body»;
- Author's programs and trainings on the base of synthesis of three above mentioned types.

Table 2

*Directions of trainings with application of health related programs*

AEROBIC TRAININGS (CARDIO LOADING)	ANAEROBIC TRAININGS (POWER EXERCISES)	"MIND & BODY" TRAININGS OF RECREATIONAL, PSYCHOREGULATION ORIENTATION	VARIANTS WITH APPLICATION OF ALL DIRECTIONS
1.gymnastic-athletic (classic aerobic, all kinds of health related, applied, sport aerobics); 2.with objects, on simulators, in swimming pool (step, pump, slide, body bar, fit ball, medical balls); 3. dancing directions (western-European and Latin-American (Jazz, salsa, , latino, , hip-hop, jazz-aerobic, salsa-aerobic and so on)); 4. cyclic (step, cycle aerobic); 5. direction "East-West", which combined European and oriental cultures in sphere of modern trainings (yoga, thai-bo, ki-bo)); 6. aqua-aerobic.	1.simulators 2.free weights 3.body building 4.functional training 5.power static training 6.terrasetts	1.pilates 2.yoga 3.stretching 4.shaping III 5.calanetic 6.auto training 7. static meditations 8.breathing	Author's programs and trainings with instructors

As on to day there exist more than 300 of health related methods of different directions. The only method to evaluate their effectiveness is to apply them. They are called by principle: the creator of this method gives name to it either by characteristics of physical loads or by choreographic exercises, which dominate in this method.

Weakening of attention to physical culture and sports resulted in worsening of material-technical base of comprehensive educational establishments. Morally old sport equipment of gyms does not permit to solve all modern problems of physical education. Because standard apparatuses "goat", rope, mats, ball, ski do not permit to train selectively muscles of arms or quickness of movements. Increased attention to innovations in health related physical culture results in application of modern equipment, which is worked out by specialists in field of sport medicine, physiology. Below we render not complete list of the most popular equipment:

- Simulators for endurance (bicycles, ergo-meters, running tracks, stepper, rowing simulators, riders, elliptic simulators);
- Simulators for training strength (with in-built weights, apparatuses with free weight – dumbbells, weight bars, etc.);
- "EKO"-type simulators, gravitational, kinesio simulators and other;

- Equipment for health related programs and trainings (core-plank, step platform, deck platform, slide, trampoline, expanders of different resistance, expanders for core plank, fit ball and step platform, gymnastic sticks, weight bars for aerobic with mass from 1 kg to 10 kg, dumbbells, rubber balls wof diameter from 55 to 75 cm, medical balls of mass from 1 kg to 5 kg, accessories for yoga (mats, belts, pulleys), ring for pilates (isotonic), rubber bands, skipping ropes, cylinders and semi-cylinders for pilates;
- Equipment for swimming pool: water dumbbells, gloves for swimming, belts, swimming board, aqua-step platforms, noodles).

Musical accompaniment is an integral part of most of health related programs, especially of aerobic programs. Music, which children like, supports proper emotional level and efficiency of trainings, helps to easier endure loads, improves psychic-emotional condition, facilitates formation of skills and, generally speaking, increase interest to trainings. Below we provide foreign musical compositions:

- Avicii feat. Etta James - ID (Levels);
- Bob Sinclar feat. Pitbull & DragonFly & Fatman Scoop - Rock The Boat;
- Javi Reina & Alex Guerrero feat. Syntheticsax - Oig 2012;

Programming of physical culture lesson with application of health related technologies will require consideration of the following details (see table 3). According to provided below details preparatory, main and final parts oof training shall be programmed.

Table 3

*Programming of trainings with application of health related technologies*

Details, required in programming of trainings with health related technologies

Details, required in programming of trainings with health related technologies				
Specificities of contingent	Presence or absence of equipment	Presence or absence of musical accompaniment	Variants of physical exercises according to purpose	Time of realization

**Conclusions:**

The principles of programming of trainings with application of health related technologies in the process of physical education of comprehensive schools' pupils are: 1) consideration of regularities of movements' training and physical qualities' development, specificities of children's contingent; 2) health related physical culture training shall meet main principles of physical education; 3) pedagogic medical monitoring of physical qualities; 4) variety of physical exercises, application of exercises from all health related technologies, correlation of intensity and duration of exercises; 5) availability of modern equipment (step platforms, medical balls, fit balls, etc.) and musical accompaniment.

*It will be purposeful to conduct the further researches* in direction of renewal of content of schoolchildren's physical culture by means of introduction of health related trainings, which correspond to pupils' interests, facilitate health related and, what is the main, trainings effect. Trainings of teaches, who would have experience in application of health related physical culture technologies, would be able to form material base and program new, modern attractive, emotionally exiting physical culture lessons, who would create scientific methodic works facilitating to complexly use modern kinds of motion functioning, depending on sex and age of pupils, who would form motivations for physical culture practicing, for independent physical culture trainings, for healthy life style – is the task of future researches.

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**Information about the author:**

**Verkhovska M.V.:** ORCID: <http://orcid.org/0000-0001-9742-1060>; ponomarenko-34@mail.ru; Oles Honchar Dnipropetrovsk National University; Avenue Gagarina, 72, Dnipropetrovs'k, 49010, Ukraine.

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