цели. Разработанная нами модель и на ее основе программа формирования у старших школьников потребностей в здоровом образе жизни подтвердили свою эффективность.

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THEORETICAL AND METHODOLOGICAL BASIS OF THE MODERN CLASSIFICATION OF COORDINATION QUALITIES

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Abstract

This article opens in details the findings of investigation of coordination qualities in students. The new approach to modern classification of coordination qualities is offered by the authors. According to the developed classification it is necessary to refer adroitness, accuracy, agility, jumping ability, marksmanship, equilibrium, rhythmicity and flexibility to coordination qualities. Each of noted types of the coordination qualities has own criteria for assessments. The authors consider in details these criteria for assessment. Besides, each of motor coordination has own factors and components of the development. The article presents these positions in details.

Key words: classification, coordination qualities, students, training.

Аннотация

Статья детально раскрывает результаты исследования координационных качеств у студентов. Авторами предлагается новый подход к современной классификации координационных качеств. Согласно разработанной классификации к координационным качествам следует относить ловкость, меткость, точность, подвижность, прыгучесть, равновесие, ритмичность и пластичность. Каждая из отмеченных разновидностей координационных качеств имеет свои критерии оценки. Авторы рассматривают детально эти критерии оценки. Кроме того, каждая из двигательных координаций имеет свои факторы и компоненты развития. В статье детально расписываются эти позиции.

Ключевые слова: классификация, координационные качества, студенты, обучение.

Introduction

The development of coordination qualities in students should be based on the usage of the system-structural approach, which includes studying of physiologic mechanisms which

open laws of motorial activity [1, 9]. Efficiency of motorial activity is defined by the ability of a choice from a considerable quantity of movements of the most expedient which gives activity the directed character in the conditions of adequacy in the process of training and perfection of coordination qualities. In such conceptual approach there are great opportunities for a concrete definition of frame of necessary coordination qualities for the purpose of their development in students of concrete trades according to the key kinds of agility necessary for realization of their professional work contain [8]. This approach inseparably linked with pedagogical aspect of development of the conforming coordination qualities on the basis of estimation of their real state at students, working out and application of the conforming procedures, taking into account professionally important motorial abilities, physical and personal individuality [10]. All this should be built under the construction on the foundations of modern classification of coordination qualities.

Methods

Purpose of research: to reveal the new classification of coordination qualities in order to work out the differentiated technigues for motorial coordinations development.

Methods of research: theoretical analysis of literary data, psihological and physiological methods, pedagogical experiment, methods of mathematical statistics.

There are 540 students, aged 18-23. The testing was carried out in October 2004 and in March 2014. The sportsmen knew about the content of the tests and agreed to take part. All the complex biological inspections of sportsmen were conducted due to the laws of Ukraine about health protection, Helsinki declaration (2000), directives of the European society 86/609 concerning participation of people in medical and biological researches.

Results and analysis

Research of a complex of coordination qualities promoted to revealing of their basic structural elements: components, types and exhibitings; factors which cause their development, criteria of estimation of indexes of their gain. As well as knowledge of the physiological mechanism it gives the chance to use rationally laws of action of an exercise stress on an organism of students in the course of perfection of coordination qualities.

Researches (2004-2014) of coordination qualities [2-7] of youth have defined that from the point of view of a modern science it is necessary to carry *adroitness*, *accuracy, marksmanship, agility, equilibrium, rhythmicity and flexibility* to them. This fact allows to bring to attention of experts classification of the coordination qualities developed on the basis of a series of general and specific characters of structural elements. Classification is constructed on taking into account an interrelation and mutuality of different coordination qualities, on what specifies resemblance of leading components, which influence on the development, and also criteria of their estimation. Meanwhile, each coordination quality has its own frame. Thus separate structural elements can be a part of other motor coordination. Meanwhile, the different sides of motorial activity thanks to structural orderliness, they are complete system and at certain specificity have the general signs. Agility provides the maximum voltage at rotary movements, turns, circular motions. Without accuracy it is impossible the conformity of locomotion to its form and content. Rhythmicity gives the chance to distribute rationally efforts in time and space. Specificity of a jumping ability is displayed in the maximum development of explosive force in the fullness of time. The task of marksmanship is – lesion of the caused purpose. Thanks to equilibrium the body stable state is reached. Flexibility which displays level of high technical readiness and nearness to perfect performance of motorial actions, forms individual style and beauty of movements.

The general sign of all coordination qualities is necessity of usage of qualitative criteria of estimation of change of their indexes. Quantitative criteria are used for the purpose of definition of rates of a gain of adroitness, accuracy, spring ability, accuracy. Research of a complex of coordination qualities has allowed to find their basic structural elements: components, types and exhibitings; factors which cause development; criteria of estimation of

indexes of their gain. Together with knowledge of the physiologic mechanism it promotes rational use of laws of action of an exercise stress on an organism of students during perfection of coordination qualities.

It is positioned that the stage of latency of the decision of complex motorial tasks concerns the basic components of *adroitness* in the conditions of a choice, speed of a motor component, synchronization of motorial and vegetative functions. We carry differentiation of spatially-power and existential parameters to exhibitings and types of adroitness, exhibiting in standard, non-standard and predicted conditions. The factors influencing development of adroitness is of ability to extrapolation, feature of functioning of central nerve system and different evaluators, level of physical readiness, age. Criteria of estimation of adroitness are: speed on a changed situation; degree of conformity of movements to character of actions of a rival or a situation; correctness of sensation of position of a body or its separate parts blindly; degree of harmony of movements with distance, weight and the subject or shell form; Accuracy of estimation of distance, efforts, speeds or directions of movements.

Definitely, that the basic components of *accuracy* is the form of motorial action, the physical exercise maintenance, a rhythm of movements. Specific to exhibitings of accuracy as follows: accuracy of a reconstruction of movements on existential and spatially-power parameters; accuracy of differentiation of muscular efforts in a concrete situation; accuracy of movements of a body and its parts in reply to a choronomic stimulus; accuracy of ballistic movements; a manipulation subjects in space; accuracy of reacting on a moving subject. The factors causing development of accuracy – level of the intercentral mutual relations (a measure of expressiveness of induction processes, irradiation, concentration); functional lability of nerve centres; a state of system of evaluators; coordination of activity of motorial and vegetative systems; a level of development of physical and coordination qualities; psycho-emotional state. Quality of reproduction of external shape of locomotion, conformity degree to dimensional, hour and power characteristics of locomotion, degree of reproduction of a rhythm of motorial action, productivity of motorial action is criteria of estimation of accuracy.

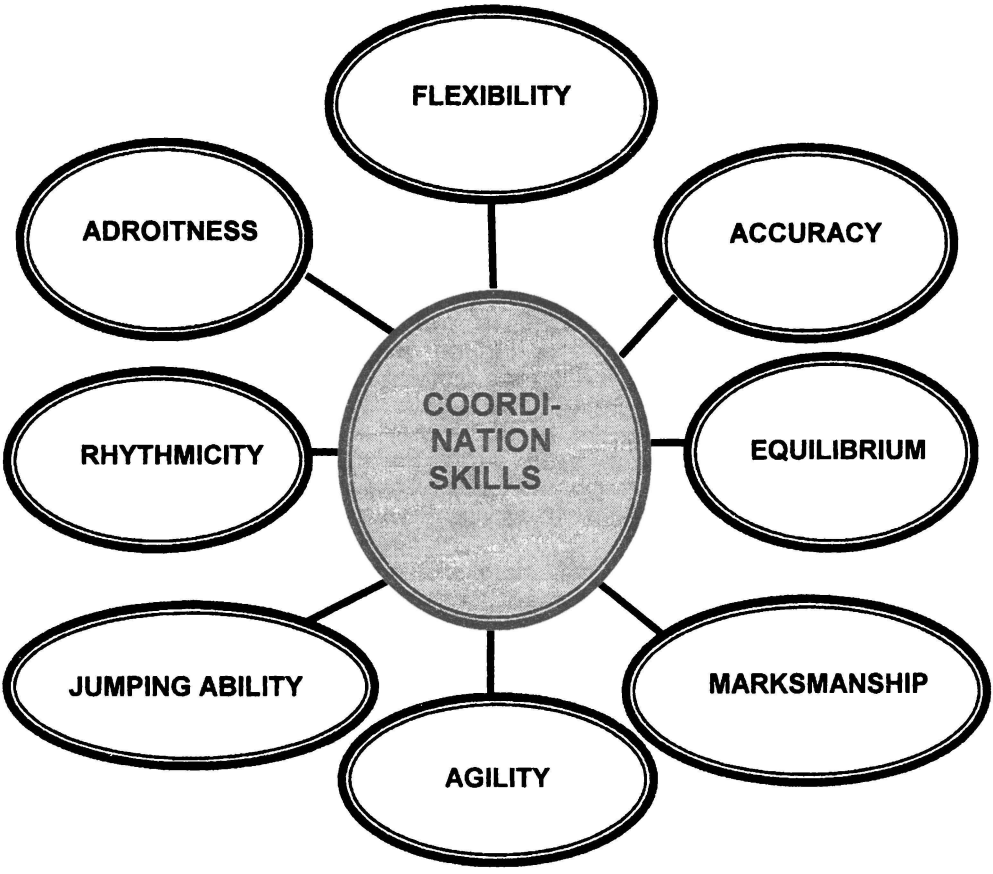

Figure.1. Classification of coordination qualities

It is revealed that the rational locating of parts of a body are: minimisation of degrees of freedom of motorial system, dosing and redistribution of muscular efforts, level of dimensional orientation concern the basic components of *equilibrium*. Exhibitings and types of conservation of equilibrium are: equilibrium after rotary movements; equilibrium after performance of jumps and jump exercises; equilibrium in actions with rectilinear and angular accelerations; equilibrium in throwings; equilibrium in a run time of different exercises with subjects; equilibrium during the long maintenance of a subject; equilibrium on a proof support; equilibrium in the conditions of the circumscribed raised support; equilibrium on the raised inclined support; equilibrium on the mobile hanged up support; equilibrium on water; equilibrium on an elastic support; equilibrium on a slippery mobile support; equilibrium in labour and household activity. Factors which cause equilibrium development, equilibrium of the excitatory processes and a measure of development of a differential inhibition, a state of the nervimuscular device, a agility level of development in joints, psychologic mood and an emotional state are. Criteria of estimation of equilibrium are: a rational locating of parts of a body in space behind different means of removal; degree of firmness of a body in a combination to other kinds of motorial actions; conservation of a certain posture; degree of stability of a body during a deflection from original position within 5-15; degree of stability of a body under condition of additional movements (a head, hands), in different conditions of a

support (raised, inclined, elastic, soft, rigid and so forth), and also in non-motional state; degree of stability of a body during libration by subjects; degree of conformity of an assessment and a self-assessment of a locating of parts of a body.

Definitely that the basic components of *agility* is the state of excitability and lability of muscles under influence impulsation motoneurons; speed of processing of the information; level of functioning and action of touchsensitive systems; level reseptional sensitivities; features of a constitution of the joint-ligamentary device; speed of incorporation of physiologic systems to actions. Exhibitings and types of agility are turns in coxofemoral and ankle joints; turns of a body and its parts; locomotions of a body and its separate parts which are carried out in non-motional state; household locomotions; locomotions in labour activity; locomotions in dances, a choreography; circular motions and turns by a head; rotations top humeral to a belt; rotation of elbow joints; rotation radiocarpal joints; rotation patellar both ankle joints; circular motions and trunk turns; circular motions of hip joints. Factors which influence agility development, lability of the excitatory processes, typological features, ability to extrapolation, psychoemotional state, morphological features of the person, elasticity of muscles and sheaves, features of a constitution of joints, a level of development of physical and coordination qualities is. Criteria of estimation of agility are: speed of change of a direction and character of locomotion on a signal; a choice of an adequate mean of performance of motorial action in concrete conditions; definition of voltage of rotary movements depending on the motorial task.

It is revealed that the basic components of a *jumping ability* are "explosive" force, speed of movements, a rhythm of movements. Exhibitings and types of a spring ability are: broad jumps and height from a place a push of one foot from dispersal with a move of hands; broad jumps and height from a place a push two feet from dispersal with a move of hands; broad jumps and height from a place a push of one foot with a move of hands; broad jumps and height from one walk with a move of hands; broad jumps from dispersal with a move of hands; jumping upwards from down on one foot with a move of hands; jumps upwards with a contact a reference point hand; overcoming of horizontal and erect hardles; overcoming of horizontal and erect hardles with a support; jumping on an elevation; overcoming of hardles with an additional support a hand; body locomotion forward upwards through the circumscribed foramen, "in a window". Factors which influence spring ability development, level of muscular and intramuscular coordination, lability of the excitatory processes, features multifunctional states of joint-ligamentary and muscular devices, degree of exhibiting of physical and coordination qualities are. Criteria of estimation of a jumping ability are: range of a landing in broad jumps from a place; departure height in jumps a push two feet from a place; height of a departure after a jump in depth; height jump on one foot; degree of a coordination of motorial actions.

Definitely that the basic components of *marksmanship* is posture acceptance , an aiming, tuning up of breath and other vegetative systems, performance of final effort. Exhibitings and types of marksmanship is the shot (throwing) on a nonmotile target; a shot (throwing) on a moving target; a shot (throwing) in locomotion, in the conditions of time restriction; a shot (throwing) against weariness; a shot (throwing) from various positions; a shot (throwing) in the locomotions bound to different kinds of labour and household activity. The factors influencing development of marksmanship: level of dimensional and time perception; a state of the device of an innervation of muscular system; a psychological state; mastering of a rhythm of motorial action; a level of development of motor-coordination qualities. The quantity of hits in the caused purpose, accuracy and speed of hit in the purpose is criteria of estimation of marksmanship.

It is positioned that rate (speed), dynamics (alternating of efforts in time), a harmony (an optimum combination of rate and dynamics) is the basic components of *rhythmicity*. Individual, collective, choronomic, intrinsic rhythms are exhibitings and types of rhythmicity. The factors influencing development of rhythmicity, are: a state of functional systems; level of restlessness in muscles; synchronization of activity of motorial units; diurnal fluctuations; a level of

development of coordination qualities; psychoemotional state; age features. Criteria of estimation of rhythmicity are level of activization of attention, degree of development of motorial memory, level of the general coordination of movements, a coordination of collective actions.

It is revealed that the basic components of *flexibility* are individual style, grace of movements and artistry. Exhibitings and types of flexibility is locomotion bracing in a posture; character of locomotion in a sculpture; the plotting of movements in a pattern; flexibility of movements of a body; an emotional mimicry; semantic gesture; postures in labour and household activity; gesture as means of completeness of motorial action. Factors which influence the flexibility development are: regularity of development of motor coordination qualities, level of intermuscular coordination, genetical features, typological features and an emotional state. Criteria of estimation of flexibility are: a measure of intrinsic sensation of character of motorial action; an artistry level of development; emotional mood; expression of senses of inspiration, relaxedness; sensation of full coalescence of locomotion with music; self-control degree; degree of empathy and presence of contact to the spectator.

Conclusion

The presented classification of coordination qualities by the general and specific characters gives the chance to position interrelation and interference of coordination qualities on the basis of a series of similar structural elements, to find their differences, to predict (in process of information accumulation) new motorial coordinations with their specific types and exhibitings that opens additional possibilities concerning increase of efficacy of training process.

The structural approach provides more penetrating integration of the theoretical and practical knowledge necessary for working out of technological innovations in control by physical readiness, oriented on effective realization of potentials. In the traditional approach to physical training of students there is a speech about perfection of adroitness, accuracy and other coordination qualities as a whole whereas the structural approach to this problem gives the chance to dilate control frameworks this process, to improve not only coordination qualities as a whole, and their concrete types depending on tasks of training and concrete conditions.

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