THEORETICAL SUBSTANTIATION OF PROGRAMS OF TARGETED DEVELOPMENT OF COORDINATION ABILITIES OF PUPILS IN LESSONS OF PHYSICAL TRAINING WITH ELEMENTS OF SPORTS GAMES

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Annotation. *Purpose*: improving the process of teaching students the art of sports games on the lessons of physical education through targeted development of coordination abilities. *Material*: an analysis of more than 20 references. *Results*: The results of the theoretical analysis of the feasibility of targeted improvement of coordination abilities of students in learning motor actions. A program for the coordination of training students in physical education lessons with elements of sports games. Identified tools, methods and instructional techniques parenting coordination abilities. The most significant coordination abilities for sports games have the ability to differentiate the motion parameters, response, spatial orientation and coordination of movements. *Conclusions*: The targeted improvement of coordination abilities of students in physical education and sports training enhances the effectiveness of the process of learning motor actions.
Keywords: coordination, ability, games, students, program, lesson.

Introduction

It is undoubted that physical culture trainings influence positively on human health. However, unfortunately children, nowadays, spend nearly all leisure time watching TV or at computer, restricting themselves in movements and forgetting that motion is a natural demand of human being. Among great variety of physical education means outdoor games take important place. Especially valuable for teenagers these games are because they can influence at the same time at motion and motivation sphere. Outdoor games permit to develop and perfect both motion (strength, endurance, quickness, flexibility, coordination) abilities and personality's qualities (initiative, independence, creativity and so on). Owing to them it is possible to influence on children's psychic processes: comprehension, thinking, attention, memory, imagination,, speech and on cognitive functioning in general. Outdoor games facilitate also moral formation. Respect to adversary, feeling of friendliness, honesty in sport struggle, strive for perfectness – all these qualities can be successfully formed owing to outdoor games [9, 13].

However, difficulty of outdoor games' techniques, low level of most pupils' motor systems do not permit to master game techniques properly and rationally use in two-side game. It forces to seek for new ways of movements' training. One of such ways is targeted development of coordination (Hirtz P. Koordinative Fehigeiten im Schulsport. – Berlin: Volk und Wissen, 1995; Martin D. Training im Kindes und Jugendalter. Schorndorf, 1998. – 247 s.) [1, 8, 12].

Among all abilities of schoolchildren coordination takes special place. Firstly, high level of coordination is a decisive pre-condition for good mastering and improvement of game's technique; secondly, "coordinated" pupil quickly adapt to quickly changing conditions in competitions, uses the most effective means of game [7, 16].

In structure of pupils' coordination abilities it is necessary to mark out perception and analysis of own movements, presence of images, dynamic, time and space characteristics of own body and its different parts in their interaction, understanding of motion task, formation of plan and certain method of movement's execution [2, 8, 11].

Thus, urgency of the research is conditioned by priority of schoolchildren coordination tasks' solution in process of outdoor games' training at physical culture lessons on the one hand and by full absence of information about coordination's development in accessible for us scientific literature – on the other hand.

The research has been fulfilled in compliance with plan of scientific-research works of department of physical culture and sports' theory and practice of Prikarpatskiy National university, named after Vasil Stefanyk for 2010-2014, by topic "Psychological-pedagogic conditions of sportsmen's training at different stages of training process" (state registration number 0101U005042).

Purpose, tasks of the work, material and methods

The purpose of the research is improvement of outdoor games' training at school lessons of physical culture by targeted development of coordination abilities.

The tasks of the work:

1. Analysis of scientific-methodic literature, devoted to influence of targeted coordination's development on quickness and quality of motion actions' mastering.
2. Working out of program of targeted development of schoolchildren's coordination in process of outdoor games' training at physical culture lessons.

The methods of the research: analysis and generalization of scientific-research literature.

Results of the research

Development of coordination abilities shall be regarded as main way to mastering of skills in outdoor games. In works by V.M. D'yatchkov (1967), M.A. Godik [4], L.P. Matveyev (1977), D-D.. Blume Einige aktuelle Probleme des Diagnostizierens koordinativen Fahigkeiten mit Sportmotorisihen Test.// Theorie und Praxis der Koperkultur. – 1984. –

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№ 2 – S. 122–124], P. Hirtz, Koordinative Fehigeiten im Schulsport. – Berlin: Volk und Wissen, 1995], V. Y. Liakh [7] there are described theoretical principles of coordination development's purposefulness in close interconnection with sport – technique and tactic perfection of children, of junior and qualified sportsmen. These ideas were implemented in a number of experimental researches, which influenced positively on quickness and quality of coordination's training [1, 5, 8, 11, 16].

Authors S.K. Mar'yasov [4], V.S. Pereversev [11] experimentally proved that application of exercises, which improve ability to reproducing and differentiation of space0time and dynamic movements' parameters, at physical culture lessons facilitate increasing of effectiveness of movements' training of primary and secondary schools' pupils.

By B.M. Shyan [14], coordination abilities develop in pre-school, junior and secondary school age. In these periods movement skills are formed easily. Ability to acquire new skills and reconstruct them progresses. If not to perfect coordination abilities in this age, then in senior school age opportunity to improve this quality is lost.

Rather bright are researches of German scientist Hirtz P. Koordinative Fehigeiten im Schulsport. – Berlin: Volk und Wissen, 1995]. He proved that during training of new and complex by coordination movements, schoolchildren of experimental classes achieved better results than pupils of control classes for equal period of time (accurately set quantity of repetitions).

Pedagogic experiments, fulfilled by V.Y. Liakh (1990) with schoolchildren of different age showed that targeted development of coordination increased quickness and quality of techniques' fulfillment. These indicators were by 8.4-48.2 % higher in experimental groups in comparison with control groups.

The next our task was to work out program of targeted development of coordination in process of outdoor games' training at physical culture lessons. The works by M.O. Bernstein [2], V.M. D'yachkov (1967), V.Y. Liakh [7], A.A. Guzhalovskiy (1986) were the theoretical basis of our program.

Fulfilling analysis of scientific-methodic literature's data for determination of importance of certain coordination abilities for certain kinds of sports we found that for outdoor games (volleyball, basket ball) such abilities are quickness of responding (they permit to quickly and timely fulfill holistic, short term movement, responding to known or unknown signal by all body or by its part – hand, leg, torso), differentiation of movements' parameters (conditioning high preciseness and saving character of space (movements' amplitude in joints), power (tonus in working muscles) and time (sense of time during fulfillment) movements' characteristics; orientation (exact determination, timely change of body position and movement in required direction), coordination of movements (combining of movements in holistic motion combinations) [7, 13, 16].

The basis of program of targeted coordination abilities' development in process of pupils' training to volleyball and basketball techniques at physical culture lessons was special training tasks, which were included in preparatory, main and final parts of lesson and duration of which was approximately 10-12 minutes. Every lesson include from 4 to 6 special training tasks with repetition of each from 4 to 6 times.

In process of realization of coordination's targeted development at physical culture lessons with elements of outdoor games we paid attention to fulfillment of two main tasks. The first: development of coordination in close connection with technical and tactic training and improvement and the second – harmonious combination of coordination's development with improvement of other motion abilities (quickness, speed-power, strength, endurance, flexibility). Main principle in program of coordination abilities' development is systemic and consequent mastering of new movements and creation on this base of more complex forms of movements' coordination. Application of exercises for coordination (especially preparatory) required observing of main didactic principles: sequence, systemic character and individualization. Successful set of preparatory exercises (from simple to complex) ensured quick mastering and fixing of motion skills, facilitated development of coordination abilities [2, 7, 15].

As means of coordination's development we used different movements (physical exercises), which, in their turn:

- were connected with overcoming of coordination difficulties;
- required correctness, quickness, rationality from executor;
- had novelty and strange fo executor character;
- in spite of being ordinary for executor, but are to be fulfilled during changes of movements or conditions.

Exercises, which satisfy even one of these requirements, can be called coordination exercises [7].

In compliance with approach by V.P. Ozerov all exercises, which were used in process of targeted development of coordination, were divided in two groups:

1) exercises for general coordination;

2) exercises for coordination in structure of technique, which is mastered.

When improving ability **for evaluation and regulation of dynamic and space-time movements' parameters** we included in first group general exercises with and without objects. By data of V.Y. Liakh [7], targeted application of 2-4 such exercises nearly at every lesson can not only improve muscle's sense, perception and attention, but also thinking. For this purpose it is necessary to practice oftener exercises by method "words without demonstration" in order for schoolchildren, independently take necessary position or fulfill movements, which they did not fulfill previously. Also it is necessary to apply exercises "throwing of ball" for certain distance for accuracy, jumps for certain distance, run with set quickness or rate of steps.

The second group included the following exercises: ball passing, service and receiving of ball in volleyball, pass and throw in basket in basketball, which shall be fulfilled at various distances and with balls of different mass, without seeing for sharpening of analyzers, with using of contrast method.

When improving of **ability for orientation in space the first group was composed of:** run with overcoming of different obstacles, mobile games, relay races with different objects (skipping rope, hoop, filled ball, tennis balls, gymnastic stick).

The second group was composed of exercises for training and improvement of different technical and tactic skills of outdoor games, general and special preparatory exercises, group game exercises of tactic character.

For improvement of **ability for coordination and reconstruction of movements** we applied different coordination exercises of outdoor games, martial arts. As additional way of development of this complex ability we used tasks, which developed intellectual, perceptive and sensor-motor processes and such will qualities as courage, decisiveness, initiative.

With improvement of **ability for responding** we applied exercises, which envisaged quick simultaneous responding to signal and choice of responding means, depending on character of signal. For training of responding to moving object we used appropriate outdoor games and exercises with previously set direction and quickness of ball's flight.

Complex of methodic means for perfection of coordination abilities was conventionally divided in two sub groups:

1. Change of method of exercise's fulfillment: direction of movement, power efforts, temp of movements, scope of movements, rhythm of movements, output and final position, "mirror" fulfillment of exercise.
2. Change of conditions of movement's fulfillment: conditions, which are constantly changing, constant changing of exercises, previous loading, previous irritation of vestibular system, additional tasks during exercise's fulfillment, combining with other exercises.

One of first methods, which were used by us in the process of program's realization, were traditional practical methods: method of movements' training in general (multiple repetition of exercises, which were not difficult by coordination) and method of movements' training by elements, usually used for training of movements, difficult by their coordination. In process of training by elements and in the first method we used preparatory exercises. Such exercises complied by their structure with movements or their elements.

As per recommendations of M.M. Lynts [6] and B.M. Shyan [15] at physical culture lessons in experimental group method of repeated exercise was widely used in process of development of coordination. This method was mainly used with learning and fulfillment of exercises, difficult by coordination. For improvement of such exercises' technique we observed relatively standard conditions and parameters of loads and structure of movements. Method of repeated, progressing exercise was used for gradual increasing of load's intensity or duration of exercise's fulfillment, depending of tasks of certain training. This method shall be apply only when children fixed technique of exercises' fulfillment and have proper coordination, with which increasing of intensity or duration of exercise would not disorder the structure of exercises' fulfillment and facilitate perfection of junior sportsmen's coordination. Method of repeated regressing exercise was used during fulfillment of highly intensive by loads movements: load shall be high at the beginning at gradually reduce by the end, in order to avoid overtiredness and disordering of technique of exercises' fulfillment with simultaneous influence on coordination abilities.

In process of method of repeated variable exercise we changed not only parameters of loads and rest but also quickness, temp, rhythm of movements, initial and final positions, application of additional exercises in standard ones, "switching off" of visual and hearing analyzers, change of direction, quickness, acceleration, sequence and value of applied forces. Method of repeated variable exercise was used for development of coordination in two main variants: method of strictly regulated variation and method of not strictly regulated variation. In the second case we used the following methodic techniques: variation, connected with using of natural unusual conditions; game variations, connected with application of game and competition methods.

In variable exercise it is necessary to consider the following rules: application of low quantity (8-12) of repetitions of different physical exercises with similar requirements to movements' control; multiple repetitions of these exercises; as often as possible changing fulfillment of certain elements and all movement in general as well as conditions of their fulfillment.

Among used by us methods one of the most efficient for development of certain coordination abilities was method of circular training [6, 7, 12]. The complex consisted of 4-6 exercises, which influence on development of different coordination abilities. Training task consisted of 2-4 repetitions of certain complex in fixed period of time. With it, in one case one and the same exercise was fulfilled 2-4 times, then in the same mode 2nd exercise, 3rd; in the second case exercise was fulfilled one time at every station. In this variant all complex (all stations) was repeated several times depending on the task of certain training. Means of circular training were reliably mastered coordination exercises. One and the same complex was applied during several weeks with strict observation of principle of progressing loading.

In process of realization of program of targeted coordination's development of pupils especially important were game and competition methods for improvement of all kinds of coordination. Application of these methods positively influenced on emotional level of trainings and complex development of coordination abilities. In the course of training-educational process games were varied and made more difficult; all actions of schoolchildren were regulated by rules, which also gradually were complicated. At one training children were offered 2-4 mobile games or relay races, depending on the task of certain lesson. For improvement of coordination abilities, competitions and games were conducted in simplified and complicated conditions. Simplified conditions were: reducing of working time,

simplification of exercises' technique, application of lightened apparatuses. Complicated conditions were: sport and mobile games at sites of reduced dimensions with higher quantity of players, additional weights.

Conclusions:

1. Targeted development of coordination abilities of schoolchildren in process of physical education and sport training facilitates increasing of movements' training process.
2. The most significant coordination abilities for outdoor games are abilities for differentiation of movements' parameters, responding, orientation in space and coordination of movements.
3. Application of combined method in process of schoolchildren's physical education will facilitate proper mastering of movements, increasing of motion skills' level and children's interest to trainings.

The prospects of further researches imply development of coordination exercises, considering age and individual characteristics at physical culture lessons with elements of outdoor games.

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