INFLUENCE OF MOTOR SKILLS' TRAINING METHODIC ON SENIOR PUPILS' SPEED-POWER AND ENDURANCE QUALITIES AT LIGHT ATHLETIC TRAININGS WITH APLICATION OF INTERDISCIPLINARY CONNECTIONS

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Abstract. *Purpose:* to determine influence of technology of integral motor and intellectual aspects' impact on development of senior pupils' motor skills. *Material:* in the research 2 groups of pupils participated: control (n=34 – boys) and experimental (n=34 – boys). *Results:* confident changes in light athletic skills have been registered. In experimental group confident changes in indicators of motor fitness were registered in tests for speed-power qualities and endurance (short and long distance run, jumps, throws). We also found that it is necessary to take into account dozing of exercises, when training motor actions. *Conclusions:* it is recommended to use approaches to creation of holistic idea of movement. Theoretical part shall be oriented on deep understanding of physical principles of movements' rational technique.
Keywords: abilities, skills, athletics, students, methods.

Introduction

At present the most difficult is to overcome psychological inertia, which hinders regular practicing of motor functioning [2; 3; 5; 12]. Especially it is characteristic for light athletic, which is traditionally considered to "difficult" kind of motor functioning and sports [17; 19; 22; 24]. Modern world is connected with intellectual work of men [4; 6; 8; 9; 10; 11]. That is why development of methodic, activating intellectual component of light athletic movements' mastering is a topical and important task. Its significance is actualized also by the fact that educational tasks are reduced to receiving required scope of knowledge by senior pupils. This scope of knowledge will permit to use physical culture means independently and consciously after leaving school during all life [28; 30; 32; 33; 34].

The problem of perfection of schoolchildren's motor training was dealt with by many authors [26; 27; 29; 31]. V.A. Trofimov and G.N. Shishkin [22] described modern requirements to physical education lesson in conditions of humanization of educational process. They offered innovative methodic of light athletic lessons' conducting: assessment of pupils' physical workability and fitness by 12-points' scale. Effectiveness of workability and pupils' fitness training depends on targeted and consequent actions in this direction. It requires strict observation of systemic approach to schoolchildren's run training, systemic and comprehensive structure of run training. N.A. Frolova [24] elucidated application of light athletic exercises for formation of junior schoolchildren's sport life style. She analyzed scientific literature on this problem. Light athletic means have wide spectrum of impact on organism. They facilitate solution of health related, educational and teaching tasks in process of physical education. Besides, they form the basis for mastering of school program. It has been proved that application of light athletic means facilitates initial sport training of children in conditions of comprehensive school.

However, in modern physical education of schoolchildren there exist a number of contradictions: between demands in development of senior pupils' motor skills and reduction of interest to physical culture. There is also contradiction between demand in creation of motor and functional basis for further development (basic kinds of motor functioning: run, jumps, throws) and difficulties in provisioning of light athletic lessons' effectiveness (subjective "difficulty" of such kind of sports). These contradictions can be removed by working out of methodic, permitting to effectively train senior pupils to light athletic motor actions. Such methodic shall cover physical education information, interdisciplinary connections (biology, physics, mathematic and other natural and humanitarian sciences) with the help of modern information technologies [13; 14; 15; 16; 18]. It will ensure wholeness and harmonious character of adolescent's growth, his deep understanding of laws of rational movements' construction on the base of fundamental sciences [23]. All these conditioned topicality of our research.

Purpose, tasks of the work, material and methods

The purpose of the work is to determine influence of technologies of motor and intellectual integral impact on development of senior pupils' motor skills.

For determination of influence of the authors' methodic of senior pupils' motor skills development we conducted pedagogic experiment. The experiment was conducted at lessons and circle light athletic trainings in period from September 2013 to May 2014. Control (n=34 – boys) and experimental (n=34 – boys) groups consisted of senior pupils from secondary school Mu'tah, Al-Karak, Jordan.

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Results of the research

We have worked out methodic of training to main light athletic movements. Main peculiar feature of this methodic is application of analogies from biology and physics. This information was presented in oral and printed forms, as methodic recommendations and video-aids.

Let us regard application of interdisciplinary connections and information technologies for training of light athletic elements on example of run (jumps) and throws. As the basis of interdisciplinary connections we chose approach, elucidated in works by N. Romanov [17]. This approach is recommended by the author for mastering of the so-called "postural method of run". This approach implies increase of effectiveness of run technique's mastering at the cost of mastering of necessary main body positions, as well as at the account of ability to contract and relax required muscular groups. For realization of this idea the author refers to analogies from animate nature, laws of physics, movement of wheel on inclined plane and so on.

For training throw technique we took methodic of initial throws' training in game kinds of sports by Zh.L. Kozina as the base [7]. Analogies from animate nature and literature are used in this methodic. Necessity of forces' addition for turn-by-turn muscles' "switching", staring from legs is explained.

At informatics, geometry and biology lessons pupils watched educational cartoon. This cartoon illustrated analogies with rule of vectors' addition in laws of bio-mechanical forces' addition when passing ball with any collective targeted action, on example of tale "Turnip" [7].

With it pupils were explained in detail the rule of forces addition by vectors with examples of forces addition by vectors. Among such examples there was demonstration of correct throw technique, with which all muscles shall work. Thus, with correct "switching" in work muscles create force, which facilitates accurate and strong throw of ball to target. This force is a result of addition of all forces' vectors, ensuring this movement. That is why when throwing all muscles shall compulsory work. It is important also from the point of view that the most frequent mistake of pupils is stance on straightened legs when throwing ball. In such stance it is not possible to fulfill speed-power component of strong and accurate throw. This material is presented in the form of cartoon, combining materials from geometry, physics, biology and physical culture that strengthen pupils' understanding.

Such approaches to creation of holistic image of movement, deep understanding of physical principles of rational movements' technique are rather effective. It was proved by the conducted research. This material was offered to pupils with the help of modern multi media technologies that increased effectiveness of its perceiving.

Application of motor skills' training with the help of interdisciplinary connections and information technologies during one academic year resulted in registration of confident improvement of results' improvement of pedagogic tests for motor fitness in experimental group. Confident changes were in results of tests for main light athletic skills. Besides, we observed confident improvement of theoretical knowledge.

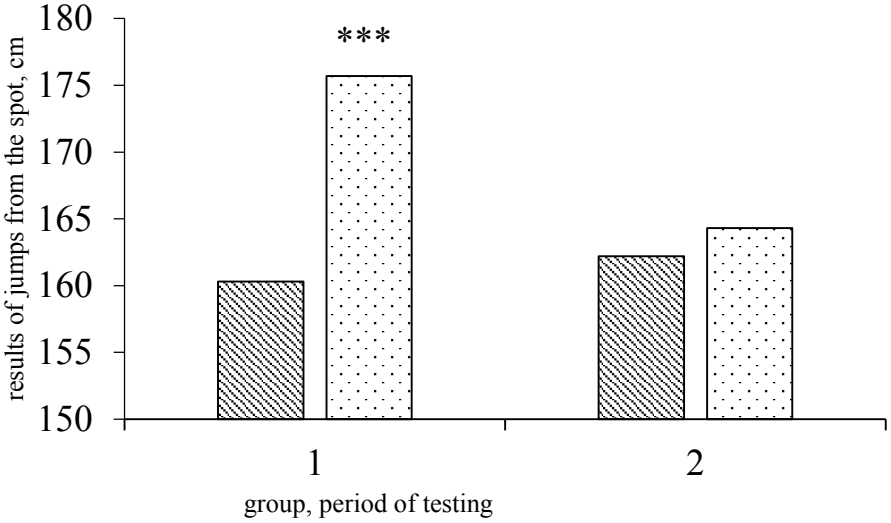

Fig. 1. Results of test "Long jump from the spot" of experimental (n=34) and control (n=34) groups before and after experiment:

1 –experimental group;
2 –control group;
*** –differences are confident with $p<0.001$;
-before experiment;
- after experiment

In experimental group of boys confident change of motor fitness indicators were registered in tests for speed-power qualities and endurance (short and long distance run, jumps, throws) (see figs. 1-4).

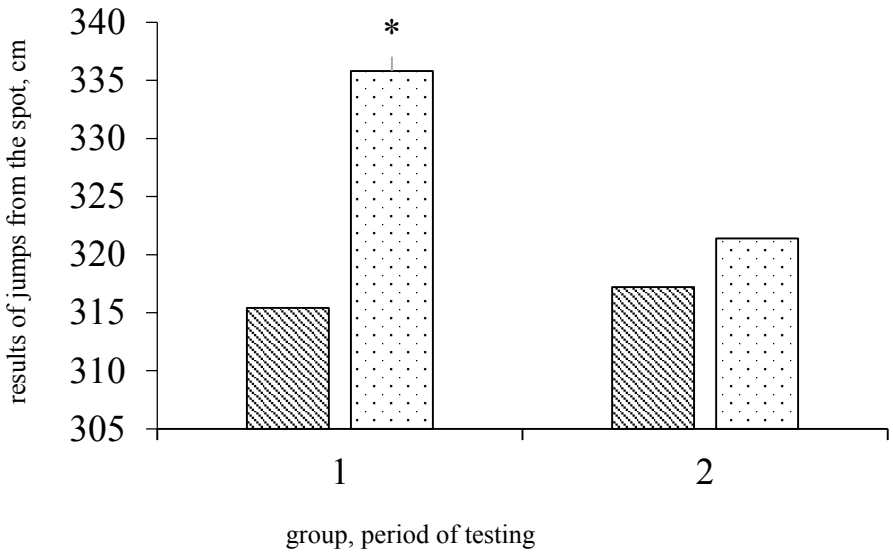

Fig. 2. Results of test "Long jump from run" of experimental (n=34) and control (n=34) groups before and after experiment:

1 –experimental group;
2 –control group;
*** –differences are confident with p<0.05;
-before experiment;
- after experiment

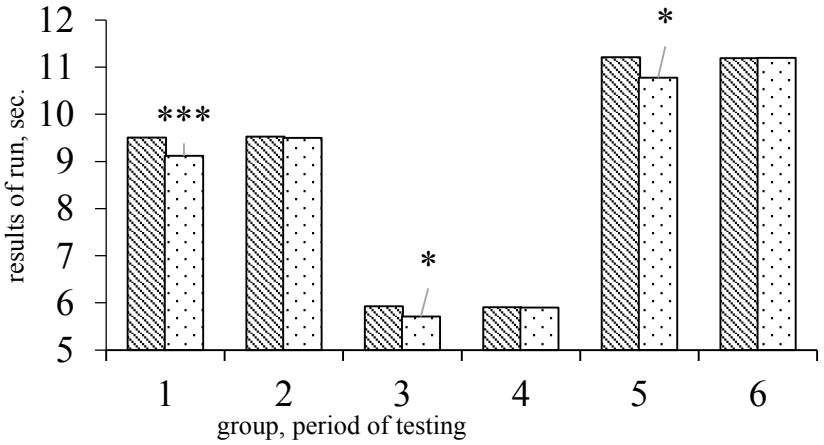

Fig. 3. Results of run tests of experimental (n=33) and control (n=34) groups before and after experiment:

1 – Run Бег 3×10 m, experimental group;
2 – Run 3×10 m, control group;
3 – Run 30 m, experimental group;
4 – Run 30 m control group;
5 – Run 60 m experimental group;
6 – Run 60 m, control group;
* – differences are confident with p<0.05;
*** – differences are confident with p<0.05;
- before experiment;
- after experiment

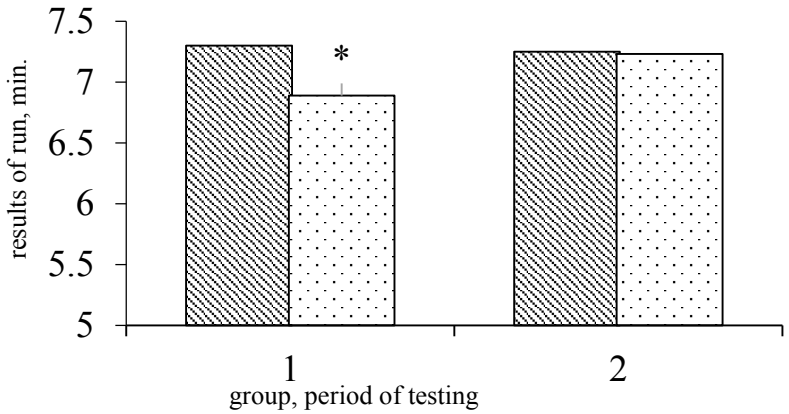

Fig. 4. Results of test "1000 meters' run" of experimental (n=33) and control (n=34) groups before and after experiment:

1 –experimental group;
2 –control group;
*** –differences are confident with $p<0.05$;
-before experiment;
- after experiment

The received results convincingly show validity and purposefulness of application of methodic of motor skills' training with the help of interdisciplinary connections and information technologies at light athletic lessons of senior pupils.

Discussion

The conducted research expands the data about construction of motor skills' training process for senior pupils. In scientific-methodic literature there is a lot of works, devoted to alternation of load and rest periods when training speed, speed-power and endurance of schoolchildren and junior sportsmen [1; 8; 10]. In the authors' opinion loads, in training of children, shall correspond to functional potentials of growing organism. With it, it is necessary to dose them and increase gradually.

As it was noted by L.P. Sushchenko [20] and Ye.A. Tabakova [21], even insignificant deviations in health in certain conditions can hinder achievement of high sport results. With orientation on children's ability to master movements one should not forget about their functional potentials. Otherwise their organisms can be overloaded. Training of junior sportsmen's motor skills is more effective, when excessive loads are not used in training process. Also effectiveness reduces with insufficient rest periods between loads [21]. From this point of view the offered by us methodic of senior pupils' training to motor skills considers psychological features of children and implies rational dozing of exercises.

Our work confirms the researches of V.A. Liakh [12]. In his researches, he showed that in period of accelerated growth (critical period) special training gives different pedagogic effect (higher in period of natural "ascend" of some motor abilities). From this point of view senior school age is the most favorable for training of strength and endurance but not very favorable for training of quickness and coordination [34-37]. In this connection rational methodic of motor skills' training (offered in our research) facilitates partial solution of problem of motor skills' training in relatively unfavorable age periods at the account of more rational technique.

Conclusions

1. We have worked out methodic of motor skills' training for senior pupils at light athletic lessons with application of interdisciplinary connections, information and interactive technologies. In our methodic, holistic approach is the main direction of motor skills' development. It implies mastering of basic movements on the base of analogies with rational and economic movement in animate nature, laws of mechanics. It conditions receiving of more deep understanding of correct technique of light athletic movements.

2. As a results of application of motor skills' training methodic during 1 academic year we registered confident improvement of pedagogic tests' for motor fitness results in experimental group's pupils.

The prospects of further researchers imply perfection of methodic of skills' formation in schoolchildren with the help of integral impact of interdisciplinary connection and information technologies.

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Conflict of interests

The authors declare that there is no conflict of interests.

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