

METHODIC OF SENIOR PUPILS' TRAINING TO THROWING MOVEMENTS ON THE BASES OF TECHNOLOGY OF COMPLEX IMPACT ON MOTOR AND INTELLECTUAL DEVELOPMENT

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Abstract

Purpose: to determine influence of technologies of integral cognitive and motor orientation on training of throwing technique in light athletic. **Material:** 2 groups of schoolgirls participated in the research: control (n = 22 – girls) and experimental (n = 21 – girls). **Results:** positive effect of authors' methodic application is ensured by adequate selection of exercises and expansion of theoretical aspect of training program. The program includes interdisciplinary connections and informational technologies for activation of associative perception of principles of rational movements' technique. Practical fulfillment of preliminary and main exercises is supplemented by theoretical studying of basic light athletic movements' bio-mechanical principles. At lessons on informatics, geometry, biology pupils watched educational film, in which there was shown analogy in rule of vectors' addition and laws of bio-mechanical forces' addition. **Conclusions:** We have shown validity and purposefulness of application of the methodic at light athletic trainings of senior forms pupils.

Keywords: abilities, skills, athletics, students, methods.

Introduction

In modern society there is acute problem of rising generation's health improvement with different mean of physical education and sport trainings, with higienic factors [1; 2; 3; 5; 6; 23]. In a set of health improvement means motor functioning is a determining one [12; 13; 14; 15; 16]. This problem is especially urgent for senior forms girls.

However, it is known [20; 21; 22; 25; 26; 29], that senior girl-pupils loose interest to compulsory lessons on physical education in school. One of the most difficult discipline in school physical education is light athletic [22; 24]. But exactly light athletic movements are the basic for a human being, because they facilitated survival of human being as species in evolutionary process [4]. That is why at present time light athletic skills are principal for many kinds of sports as well as for many movements of everyday life. In this connection there appears a problem of increasing senior pupils' interest to light athletic trainings as well as increasing of effectiveness of light athletic trainings. Working out of appropriate means and methods will facilitate solution of the problem.

It is known [8; 9; 10; 11; 28; 31], that with increasing of mastering level of any skills wish to continue this kind of functioning also increases. It facilitates further perfection in this kind of activity.

In this connection especially difficult is to overcome psychological inertia, which hinders from regular practicing of some kind of motor functioning. Especially it is characteristic for light athletic, which is traditionally "difficult" kind of sports [17]. That is why working out of methodic for activation of intellectual component of light athletic exercises' mastering is an urgent and topical task. Its significance is actualized also by the fact that educational tasks are reduced to obtaining of necessary scope of knowledge by schoolchildren. After leaving school this knowledge will permit to use physical culture means independently and consciously during all life [27; 30; 32; 33; 34].

Purpose, tasks of the work, material and methods

The purpose of the work is to determine influence of technologies of integral cognitive and motor orientation on training of throwing technique in light athletic.

For determination of authors' methodic (implying training of senior girl-pupils' motor skills at academic and circle light athletic trainings) influence we conducted formation pedagogic experiment in period from September 2013 to May 2014. Control (n = 22) and experimental (n = 21) groups were composed of senior forms girl-pupils from Mu'tah, Al-Karak, Jordan.

Results of the research

For training of light athletic basic movements we worked out methodic, based on practical fulfillment of preliminary and main exercises in combination with theoretical study of bio-mechanical principles of light athletic movements. With it we used interdisciplinary connections and informational technologies for activation of associative perception of principles of movements' rational technique (see fig.1.).

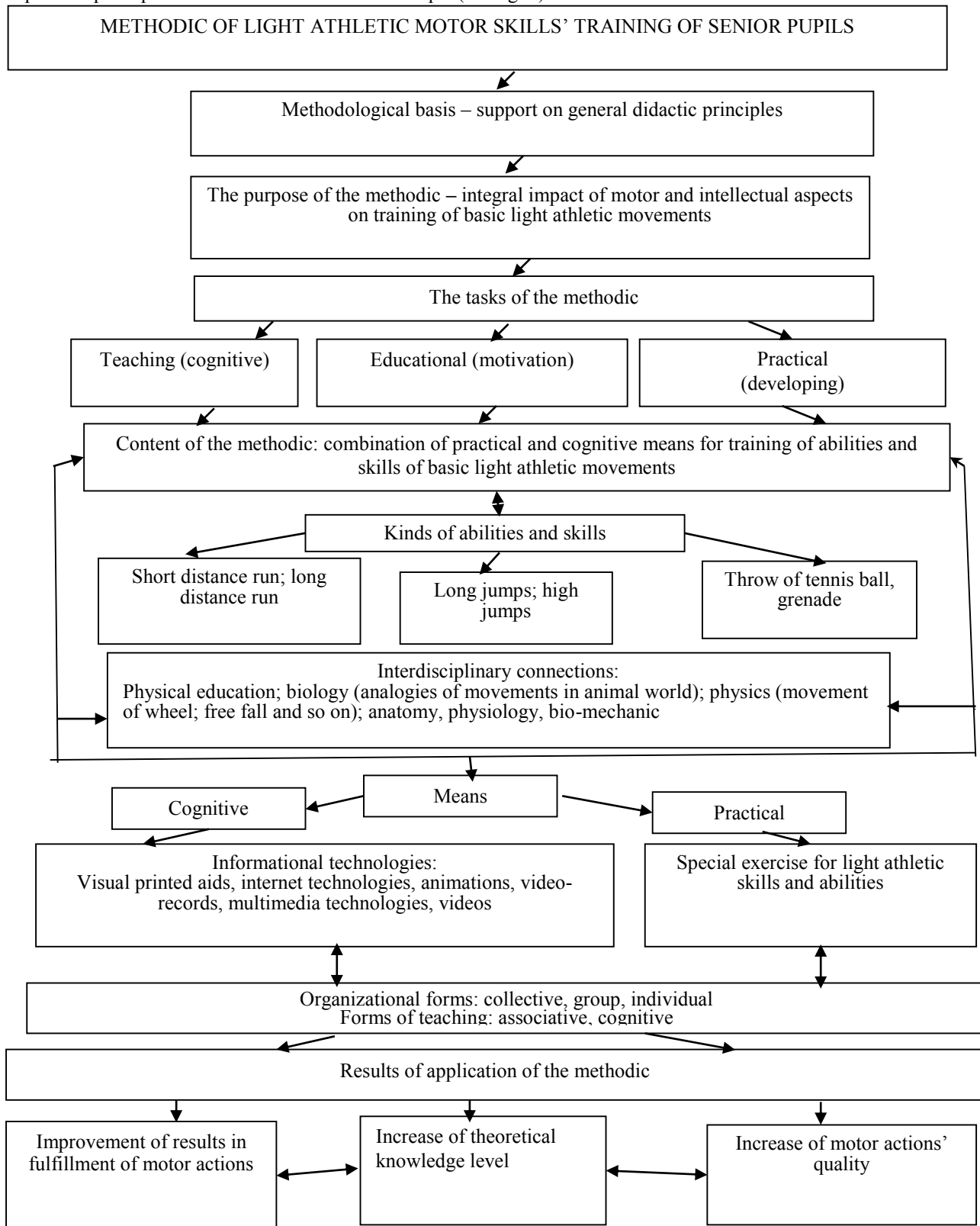


Fig.1. Model of authors' methodic of motor skills' and abilities' training for senior forms pupils at light athletic lessons

Training of throwing was a component of methodic of light athletic motor skills' training. Throws are characteristic for light athletic. Besides, throws are one of basic movements of man. Application of interdisciplinary connections in practical realization was the following: at lessons on informatics, geometry, biology pupils watched educational cartoon. In the film there was shown analogy in rules of vectors' addition and laws of bio-mechanical forcers' addition. As an example there were used passes of ball, interaction of forces of ants when they carry load, rules of forces addition in any collective unidirectional action [7].

The pupils are explained in detail the rule of forces addition by vectors. It is accompanied by examples of forces addition by vectors. For example, correct technique of ball pass in game kinds of sports was demonstrated. In the same way addition of forces by vectors takes place in light athletic throws. Thus, the pupils were shown how muscles shall "switch" in the movement correctly as well as how they create force, which facilitates accurate and strong throw in target (see fig. 2). This force is a result of addition of all forces' vectors, which ensure this movement. That is why, when passing ball and when throwing in light athletic all muscles shall work. It is important because the most frequent mistake of schoolchildren is stance of straightened legs, when throwing. With it correct usage of speed-power component of the movement is impossible, as well as proper accuracy of throw [7].

As an analogy from animated nature we supplied example of collective carrying of load by ants, when forces vectors of all ants' actions are added. From this point of view it is useful to bent legs with ball passing. With it the biggest legs' muscles "switch" in action. It ensures speed-power aspect for fulfillment of this technique. Also examples from epic literature were given as analogies of forces addition by vectors [7].

This material is presented as educational film (cartoon), in which materials of geometry, physics, biology and physical culture are combined. It facilitated correct understanding of material by pupils.



Fig.2. Fragments of educational cartoon: rules of forces addition by vectors when throwing [7]

As a result of experiment in experimental group we registered confident changes of testing indicators of motor fitness.

Table 1. Indicators of motor fitness of control (n=22) and experimental (n=21) groups before and after experiment (girls)

Indicators	Period of testing	Group	\bar{X}	S	m	P BE-AE	P CG-EG, BE	P CG-EG, AE
1	2	3	4	5	6	9	11	13
Throw of ball (m)	BE	EG	15,24	2,13	0,18	0,03	0,65	0,02
	AE		17,35	2,08	0,15			
	BE	CG	15,36	2,12	0,18			
	AE		15,39	2,16	0,16			
Experts' assessment of throw technique, points	BE	EG	2,87	0,56	0,22	0,02	0,19	0,01
	AE		4,21	0,58	0,21			
	BE	CG	2,77	0,49	0,17	0,47		
	AE		2,92	0,65	0,19			
Mark for theoretical testing, points	BE	EG	25,4	5,76	0,82	0,02	0,67	0,03
	AE		47,8	5,29	0,77			
	BE	CG	26,7	5,34	0,79	0,15		
	AE		27,1	6,73	0,76			

Notes: CG – control group; EG – experimental group; BE – before experiment; AE – after experiment.

Confident changes in girls' motor fitness indicators were registered in test "Throw of ball, m".

In control group such changes were not confident (see table 1).

Effectiveness of our methodic application is confirmed also by the fact that in experimental group level of motor skills increased. This level was determined by experts' assessment and theoretical knowledge (see table 1). In control group such changes were not confident (see table 1).

It should also be noted that control and experimental groups did not differ between each other confidently before experiment. After experiment the groups differed confidently by all tested parameters (see table 1). The received results show the validity and purposefulness of application of the worked out methodic. Thus, application of the worked out methodic of motor actions' training facilitates increasing of motor fitness indicators. It is an important aspect of schoolchildren's physical education. Positive effect of application of this methodic is ensured by adequate selection of exercises and expansion of theoretical aspect of training program. This program includes interdisciplinary connections and informational technologies.

Discussion

The received results confirm literature data about age peculiarities of senior school age children. G.L. Apanasenko [2]; Zh.L. Kozina [7], S.S. Iermakov [6], O.V. Antonov [1] showed demand in research of senior school age children's physical education. It permits to scientifically substantiate training programs and normative, concerning physical condition and physical fitness of schoolchildren. Presence of knowledge on these questions permits to form principle approaches to understanding of purposes, tasks and contents of physical culture school program показали необходимость исследования проблем физического состояния детей старшего школьного возраста. [18; 19].

One of the most important factors of child's growth and development is satisfaction of his (her) natural demand in motion. However, this natural demand is not sufficient. In our work we also confirm the results of authors [26; 27] that in puberty age demand in motion increases, though satisfaction of this increased demand is rather difficult in conditions of modern civilization. In this connection application of informational technologies with information about rational construction of movements permits to form children's proper attitude to training of motor skills [8; 9; 11]

Concerning application of informational technologies and interdisciplinary connections we confirmed the data of L.S. Dvorkin [5]. Our research also widens results of researches, conducted by Zh.L. Kozina [7] and S. S. Iermakov [6]. In these researches there was substantiation of working out and application of informational technologies for provisioning of trainings' visibility by different means of motor functioning. However, in works by Zh.L. Kozina [7; 8; 10] informational multimedia technologies for application in sport activity are stressed. Our work is devoted to working out of methodic of informational technologies' application of sphere of schoolchildren's physical education.

Our research expands the data of F.I. Sobianin [19], who elucidates different aspects of application of interdisciplinary connections in teaching process. The author shows effectiveness of interdisciplinary connections and information technologies' applications in training of movements.

Conclusions:

1. As a result of theoretical analysis and practical work we developed methodic of throws' training, which implied application of interdisciplinary connections and information technologies. At lessons on informatics, geometry, biology pupils watched educational film, in which analogy between forces vectors addition and laws of bio-mechanical addition of forces was shown.

2. As a result of the researches in experimental group we registered confident changes of testing indicators of motor fitness level. Level of mastering of motor skills also increased in experimental group that was registered by experts' assessments. In control group such changes were not confident.

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

The prospects of further researches imply perfection of methodic of skills' formation in schoolchildren with the help of integral impact of interdisciplinary connections and informational technologies.

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Conflict of interests

The authors declare that there is no conflict of interests.

References:

1. Antonov OV. Timbuilding s elementami peshekhodnogo turizma kak forma provedeniia vneurochnykh zaniatij v shkole [Team building with elements of hiking as a form of out of curriculum classes at school]. *IX Mezhdunarodnaia konferenciia «Problemy i perspektivy razvitiia sportivnykh igr i edinoborstv v vysshikh uchebnykh zavedeniakh». 8–9 fevralia 2013 goda, Belgorod* [IX International conference “Problems and prospects of development of sport games and martial arts at higher educational establishments” February 8–9, Belgorod], Belgorod, 2013, p. 35–39. (in Russian)
2. Apanasenko GL, Kozakevich VK, Korovina LD. Uroven' somaticheskogo zdorov'ia, ego sviaz' s fizicheskim razvitiem i prognozirovanie zaboлеваemosti podrostkov [Level of somatic health, its connection with physical condition and prognostication of adolescents' morbidity]. *Valeologiya*, 2003;1:19–24. (in Russian)
3. Bal'sevich VK. Infrastruktura vysokoeffektivnogo fizicheskogo vospitaniia v obshcheobrazovatel'noj shkole [Infrastructure of highly effective physical education in comprehensive school]. *Fizicheskaia kul'tura: vospitanie, obrazovanie, trenirovka* 2003;4:3–12. (in Russian)
4. Beritashvili IS. *Struktura i funktsii kory bol'shogo mozga* [Structure and functions of brain cortex], Moscow, 1969. (in Russian)
5. Dvorkin LS. Vozrastnye osobennosti razvitiia silovykh vozmozhnostej shkol'nikov 7–17 let [Age peculiarities of power potentials' development in 7–17 years old pupils]. *Fizicheskaia kul'tura: vospitanie, obrazovanie, trenirovka*, 2003;3:11–13. (in Russian)
6. Iermakov SS, Krivencova IV, Minenok AA. Osobennosti fizicheskogo vospitaniia studentov special'noj medicinskoj grupy v pedagogicheskom vuze [Peculiarities of physical education of special health group's students in pedagogic HEE]. *Visnik Chernigivs'kogo derzhavnogo pedagogichnogo universitetu imeni T.G.Shevchenka* 2013;2(107):193–196. (in Russian)
7. Kozina ZhL. Effektivnost' nachal'nogo obucheniia tekhnike gandbola na osnove primeneniia sovremennykh informacionnykh tekhnologij [Effectiveness of initial training of handball technique on the base of modern informational technologies]. *Fizicheskoe vospitanie studentov tvorcheskikh special'nostej* 2004;4:22–28. (in Russian)
8. Kozina ZhL. Analiz i obobshchenie rezul'tatov prakticheskoi realizacii koncepcii individual'nogo podkhoda v trenirovochnom processe v sportivnykh igrakh [Analysis and generalization of results of practical realization of individual approach conception in trainings of sport games]. *Fizicheskoe vospitanie studentov tvorcheskikh special'nostej* 2009;2:34–47. (in Russian)
9. Kozina ZhL, Sliusarev VF, Volkov IeP. *Efektivnist' zastosovannia netradicijnoi formi autogennogo trenuvannia dlia vidnovlennia pracezdatnosti basketbolistiv* [Effectiveness of non traditional form of autogenic training for recreation of basketball players' workability]. 2001;14:8–15. (in Ukrainian)
10. Kozina ZhL. *Sistema individualizacii podgotovki sportsmenov v igrovyykh vidakh sporta* [System of individualization of sportsmen's training in game kinds of sports], Lambret Academic Publishing Russia; 2011. (in Russian).
11. Kozina ZhL. Rezul'taty razrabotki i prakticheskogo primeneniia algoritma sistemnogo analiza v nauchnykh issledovaniakh v oblasti sportivnykh igr [Results of development and practical application of system analysis algorithm in scientific researches in sphere of sport games]. *Slobzhans'kij naukovno-sportivnij visnik*, 2006;9:157–165. (in Russian)
12. Liakh VI, Zdanevich AA. *Kompleksnaia programma fizicheskogo vospitaniia uchaschichsia 11 klassov* [Complex program of 11 form pupils' physical education], Moscow: MO RF; 2002. (in Russian)
13. Fedorova VN. *Mezhpredmetnye svyazi estestvenno–matematicheskikh disciplin* [Interdisciplinary connections of natural–mathematic disciplines], Moscow: Education; 1980. (in Russian)
14. Podstawski Robert, Boryslawski Krzysztof. Influence of pe teachers' qualifications on the motor abilities of early school–age children. *Physical education of students* 2014;1:56–63. <http://dx.doi.org/10.6084/m9.figshare.903695>
15. Pukhov DN. Pedagogiko–psikhologicheskie aspekty analiza otnosheniia shkol'nikov 5–9 klassov k fizicheskoi kul'ture [Pedagogic–psychological aspects of analysis of 5–9 form pupils' attitude to physical culture]. *Pedagogics, psychology, medical–biological problems of physical training and sports* 2011;2(19):1–8. (in Russian)

16. Zajcev VP, Iermakov SS, Manucharian SV, Fediaj IA. Rekreaciia kak nauchnaia disciplina i ee istoricheskie aspekty [Recreation as scientific discipline and its historical aspects]. *Pedagogics, psychology, medical–biological problems of physical training and sports*, 2012;12:46–52. (in Russian)
17. Romanov Nikolaj, Robson Dzhon. *Poznyj metod bega* [Postural method of run], Moscow: Mann, Ivanov and Ferber; 2013. (in Russian)
18. Sitdikova LM. *Mezhpredmetnye sviazi fiziki i literatury kak sredstvo povysheniia kachestva znaniy uchashchikhsia v gumanitarnykh klassakh. Cand. Diss.* [Interdisciplinary connections of physics and literature as mean of knowledge quality improvement of humanitarian pupils and students. Cand. Diss.], Chelyabinsk; 1997. (in Russian)
19. Sopianin FI, Bocharova VI, Kulikov IA. Vyivlenie effektivnykh sredstv fizicheskoi kul'tury, sposobstvuiushchikh povysheniiu umstvennoi rabotosposobnosti studentov vuzov [Determination of effective physical culture means facilitating increase of HEE students' mental workability]. *Kul'tura fizicheskaia i zdorov'e*, 2011;11:29–32. (in Russian)
20. Sushchenko LP. Informacijni ta komunikacijni tehnologii: pedagogichnij aspekt [Information and communication technologies: pedagogic aspect]. *Nepererвна profesijna osvita: teoriia i praktika*, 2004;2:29–36. (in Ukrainian)
21. Tabakova EA. *Normativnaia ocenka fizicheskogo razvitiia i fizicheskoi podgotovlennosti plovcov i shkol'nikov 12–16 let. Cand. Diss.* [Normative assessment of physical condition and physical fitness of swimmers and 12–16 years old pupils. Cand. Diss.], Moscow; 2002. (in Russian)
22. Trofimov VA, Shilkin GN. Osobennosti metodiki provedeniia uroka po legkoj atletike v sovremennoj shkole [Peculiarities of methodic of light athletic lesson in modern school]. *Pedagogics, psychology, medical–biological problems of physical training and sports*, 2009;6:150–154. (in Russian)
23. Ushinskij KD. *Chelovek kak predmet vospitaniia* [Person as a subject of education], Moscow: 1950. (in Russian)
24. Frolova NA. Primenenie legkoatleticheskikh uprazhnenij v processe formirovaniia sportivnogo sposoba zhizni mladshikh shkol'nikov [Application of light athletic exercises in formation of junior pupils' sport way of life]. *Pedagogics, psychology, medical–biological problems of physical training and sports*, 2010;4:147–149. (in Russian)
25. Chernoiarova OA. Mezhpredmetnye sviazi v sisteme prepodavaniia sportivno–pedagogicheskikh disciplin budushchim uchiteliam fizicheskoi kul'tury [Interdisciplinary connections in system of sport–pedagogic disciplines' teaching of future physical culture instructors]. *Vestnik Chuvashskogo gosudarstvennogo pedagogicheskogo universiteta im. I.Ia. Iakovleva* 1999;8:120–122. (in Russian)
26. Podstawski Robert, Omelan Aneta, Zapert Monika, Żurek Piotr. School and out–of–school physical activity of children in rural areas. *Physical education of students* 2014;4:55–60. <http://dx.doi.org/10.6084/m9.figshare.979315>
27. Podstawski Robert, Zwolińska Danuta, Urbańska–Gizińska Renata, Nowosielska–Swadźba Danuta. The effect of learning environment factors on biological development of first year students. *Physical education of students* 2013;6:103–109. <http://dx.doi.org/10.6084/m9.figshare.845594>
28. Al–Ravashdeh Abdel Baset, Kozina ZhL, Kramskoy SI, Bazilyuk TA. Application of interdisciplinary connections and information technologies for development of motor skills in light athletic of girls – senior form pupils. *Pedagogics, psychology, medical–biological problems of physical training and sports*, 2015;8:9–16. <http://dx.doi.org/10.15561/18189172.2015.0802>.
29. Al–Ravashdeh Abdel Baset, Kozina ZhL, Bazilyuk TA, Ilnickaya AS. Influence of skills' training methodic with the application of interdisciplinary connections on motor fitness of senior pupils in light athletic. *Pedagogics, psychology, medical–biological problems of physical training and sports*, 2015;9:3–11. <http://dx.doi.org/10.15561/18189172.2015.0901>
30. David Hortigüela–Alcalá, Ángel Pérez–Pueyo, José Moncada–Jiménez. An analysis of the responsibility of physical education students depending on the teaching methodology received. *Journal of Physical Education and Sport*, 2015;15(2):202–207.
31. Prusik Krzysztof, Prusik Katarzyna, Kozina ZhL, Iermakov SS. Features of physical development, physical preparedness and functional state of boys and girls – students of Polish higher educational establishments. *Physical Education of Students*, 2013;1:54–61. <http://dx.doi.org/10.6084/m9.figshare.96415>
32. Kozina ZhL, Al–Ravashdeh Abdel Baset, Kramskoy SI, Ilnickaya AS. Methodic of skills' formation of light athletics motor actions with the help of inter–disciplinary communications and informational technologies, worked out for senior form pupils. *Pedagogics, psychology, medicalbiological problems of physical training and sports*, 2015;7:17–24. <http://dx.doi.org/10.15561/18189172.2015.0703>

-
33. Krzysztof Prusik, Pavol Bartik, Sergii Iermakov, Agnieszka Garapuczyk, Walery Zukow. Assessment of the level of physical development and physical fitness overall girls aged 10–14 years. *Journal of Health Sciences*, 2013;3(10):401–418.
 34. Hribovska Iryna, Danylevych Myroslava, Ivanochko Victoria, Shchur Lydia. Organizational conditions of healthy lifestyle promotion for arts students. *Journal of Physical Education and Sport*. 2015;15(2):218 – 224.
 35. Prusik Katarzyna, Iermakov SS, Kozina ZhL. Indexes of physical development, physical preparedness and functional state of polish students. *Pedagogics, psychology, medical–biological problems of physical training and sports*, 2012;12:113–122. <http://dx.doi.org/10.6084/m9.figshare.105467>
 36. Patryk Smolarz, Marek Napierała, Mirosława Cieślicka, Walery Zukow, Radosław Muszkiet, Sergii Iermakov. The state of somatic features and the general fitness of thirteen–year–old footballer. *Journal of Health Sciences*, 2013;3(16):209–230.
 37. Kozina Zhanneta, Sobko Irina, Bazulyk Tatyana, Ryepko Olena, Lachno Olena, Ilinskaya Anna. The applying of the concept of individualization in sport. *Journal of Physical Education and Sport*, 2015;15(2), pp.172 – 177. <http://dx.doi.org/10.7752/jpes.2015.02027>

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