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THE EFFECTIVENESS OF USING TACTICAL TRAINING TECHNIQUES FOR TENNIS PLAYERS 10–12 YEARS OLD BY USING ANIMATED ILLUSTRATIONS

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Key words: *tactics, training, animation, tennis, technology.*

Purpose: substantiation of the effectiveness of using tactical training techniques by using animated illustrations in the training process of tennis players 10–12 years old. Materials and methods. The experiment involved 16 tennis players aged 10–12 years, each with 8 people. In the control group, the classes were conducted according to the traditional method, and in the experimental group, exercises with the use of animated illustrations and auxiliary specialized simulators for technical and tactical training of players were additionally introduced. Pedagogical observations were conducted in the process of training sessions. Psychophysiological testing was performed by using computer programs "Psychodiagnostics", "Diagnostics" and the program S. Ermakova "Choice reaction", as well as testing of technical and tactical readiness according to the international system of "International Tennis Number" (MTN). In the statistical analysis, a comparative analysis of the mean values and values for the Student's t-criterion was carried out.

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Results. The principle of clarity of training is given and the interactive method of solving tactical tasks is used. It is shown that the applied method of training of tennis players has increased practically all indicators of testing of special physical and technical and tactical readiness, quality of execution of blows in draws. The developed method has a positive effect on the accuracy of strikes and the effectiveness of the completion of draws in matches. The developed method has a positive effect on the accuracy of shots and the effectiveness of the completion of draws in matches. Conclusions. Tactical combinations in tennis are very variable. The tactics of a tennis player depend on the style of play. However, it is difficult for athletes aged 10–12 to develop their style of play due to the psychological stress of competition. Thus, it is most effective to use in matches tactical combinations and actions studied in advance and brought to automatism. In our work the efficiency of application of a technique of tactical preparation of tennis players with the use of animated illustrations is proved. This technique has improved the quality and accuracy of strikes in a given area, as well as facilitated faster decision-making in game situations on the court. The developed technique is adequate to the solution of problems of training process on tactical preparation of tennis players of 10–12 years and can be recommended in wide practice of trainings of tennis players of age category till 10 years.

ЕФЕКТИВНІСТЬ ВИКОРИСТАННЯ МЕТОДИКИ ТАКТИЧНОЇ ПІДГОТОВКИ ТЕНІСИСТІВ 10–12 РОКІВ ІЗ ВИКОРИСТАННЯМ АНІМАЦІЙНИХ ІЛЮСТРАЦІЙ

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Ключові слова: *тактика, підготовка, анімація, теніс, технології.*

Мета: обґрунтування ефективності використання методики тактичної підготовки із застосуванням анімаційних ілюстрацій у тренувальному процесі тенісистів 10–12 років. Матеріали та методи. У дослідженні взяли участь 16 тенісистів віком 10–12 років, із них 8 тенісистів було обрано до складу експериментальної групи та 8 тенісистів увійшли до складу контрольної групи. У контрольній групі заняття проводилися за традиційною методикою, а в експериментальній групі додатково були введені вправи з використанням анімаційних ілюстрацій та допоміжні спеціалізовані тренажери з техніко-тактичної підготовки гравців. Педагогічні спостереження проводилися в процесі тренувань. Було проведено психофізіологічне тестування за допомогою комп'ютерних програм «Психодіагностика», «Діагност», програми С.С. Єрмакова «Реакція вибору», а також тестування техніко-тактичної підготовленості за всесвітньою системою «Міжнародного тенісного номеру» (MTN). У статистичному аналізі порівняно середні значення, значення критерію Стьюдента. Результати. Наведено принцип наочності навчання та використано інтерактивний метод вирішення тактичних завдань. Доведено, що метод навчання тенісистів, який застосовується, збільшив практично всі показники тестування спеціальної фізичної та техніко-тактичної підготовленості, якості виконання ударів у розіграшах. Розроблений метод позитивно впливає на точність ударів і результативність завершення розіграшів у матчах. Висновки. Тактичні комбінації у тенісі дуже варіативні. Тактика тенісиста залежить від стилю гри. Проте спортсменам віком 10–12 років складно виробити свій стиль гри через психологічну напругу на змаганнях. Таким чином, найефективнішим є використання у матчах заздалегідь вивчених та доведених до автоматизму тактичних комбінацій і дій. У нашій роботі розкрито ефективність застосування методики тактичної підготовки тенісистів із використанням анімаційних ілюстрацій. Ця методика дала змогу покращити якість і точність влучення ударів у визначену зону, а також сприяла більш швидкому ухваленню рішення в ігрових ситуаціях на корті. Розроблена методика адекватна розв'язанню завдань тренувального процесу з тактичної підготовки тенісистів 10–12 років і може бути рекомендована у широкій практиці тренувань тенісистів вікової категорії до 10 років.

Formulation of the problem. Modern tennis is extremely topical, dynamic sports game, which has a high speed, capacity, variability of strokes and displacements of the players around the court and the variety of their actions on the court [2, p. 127].

Studies of the tactical preparedness of tennis players involved a lot of tennis experts. Tactical training with young tennis players is one of the most important task, because it means learning to play [1, p. 129]. In tennis you need to choose the manner, place and time of action, quickly and correctly respond to the ball and counter-action of rival, to be able to consciously direct the ball into the court to win the match [3, p. 637].

Tactical training of tennis players in the category of 10–12 years is a great difficulty. Due to the lack of playing experience, in conditions of lack of time and psychological stress in matches, young tennis players most often use a defensive style of play and only one tactical model is to keep the ball in the game, but it is not always effective. Today, tennis is dominated by an attacking style of play and those who play variably and versatility with a minimum number of errors are

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prevail. An effective solution to this problem is prelearned tactical combinations and interactions.

Thinking works only if for this in the mind there is the necessary material and in particular the existence of a certain number of ideas, examples, facts. If more ideas are formed in the student's mind, if the clearer and brighter they are, the more material there is for the "work of thought". Consequently, the organization of the training process of tennis players on the study and perception of tactical situations and models using visual illustrations significantly accelerates knowledge tactical process in tennis and contributes to increasing interest in studies [3, p. 639].

The purpose of work was to substantiate the effectiveness of using tactical training techniques by using animated illustrations in the training process of tennis players 10–12 years old.

Presentation of the main research material. The study involved 16 tennis players aged 10–12 years, who are engaged in the tennis section at the sports club "Polytechnic" of the National Technical University "Kharkov Polytechnic Institute". 8 tennis players were selected as part of the experimental group and 8 tennis players were included in the control group. Tennis players of both groups did not differ significantly in terms of tactical skill. Players were randomly assigned: 4 girls and 4 boys were present in each group. The experiment was conducted for 6 months in the preparatory period at the stage of basic training of the second year of study. To achieve the goal of the study, the following tasks were set:

– to analyze the scientific and methodological literature on the issue, to determine relevance, research methods and the research contingent;

– to provide a psychophysiological testing, testing the technical and tactical training for the procedure of the international tennis number "ITN", pedagogical observation;

– to introduce an innovative program of tactical training by using animated illustrations into the training process of tennis players 10–12 years old;

– to re-test and to get results;

– to analyze and systematize data, to conduct a mathematical analysis of the research results, to formulate conclusions.

The following methods were solving the tasks:

– an analysis and synthesis of scientific and methodological literature on the research problem;

– methods of pedagogical observation;

– psychophysiological research methods on the computer system "Diagnost";

– a method for assessing technical and tactical preparedness for the methodology of the international tennis number "ITN";

– methods of mathematical statistics using computer programs "EXCEL" and "SPSS".

The methods of psychophysiological testing included: a simple reaction to a light stimulus, a simple reaction to a sound stimulus, a tapping test. The methods of evaluation of technical and tactical testing included: the test on the deep ground strokes, the test on the deep of volley, the test on precision ground strokes, the test on serve, the test on mobility of movement.

The mathematical calculation of the results of the study was carried out by statistical software package "SPSS 23.0" and "EXELL" counting traditional indicators: the arithmetic mean (M), an error arithmetic mean (S), t-reliability criterion for equal samples.

The tactical training technique for young tennis players was used for 9 months in preparation for the Ukrainian competitions.

The control group practiced on traditional method of tactical training, the experimental group had a training process with a new program of tactical animated illustration. The coach gave all the combinations and set specific tasks for the players, depending on their technical arsenal. In almost every training session, the coach, using a multimedia projector, demonstrated animations, analyzed certain interactions and gave tactical settings for the training session. An example of animated illustrations is presented in fig. 1, 2, 3,

Fig. 1. Animated illustration of the tactical interaction "Eight"

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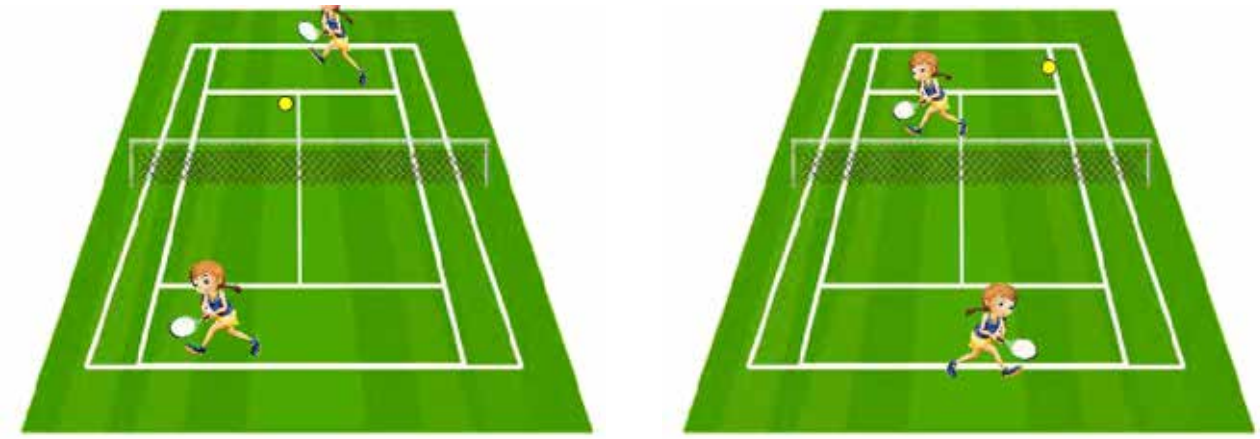

Fig. 2. Animation illustration of the tactical interaction "Triangle"

Fig. 3. Animation illustration of the tactical interaction "The Reverse Cross"

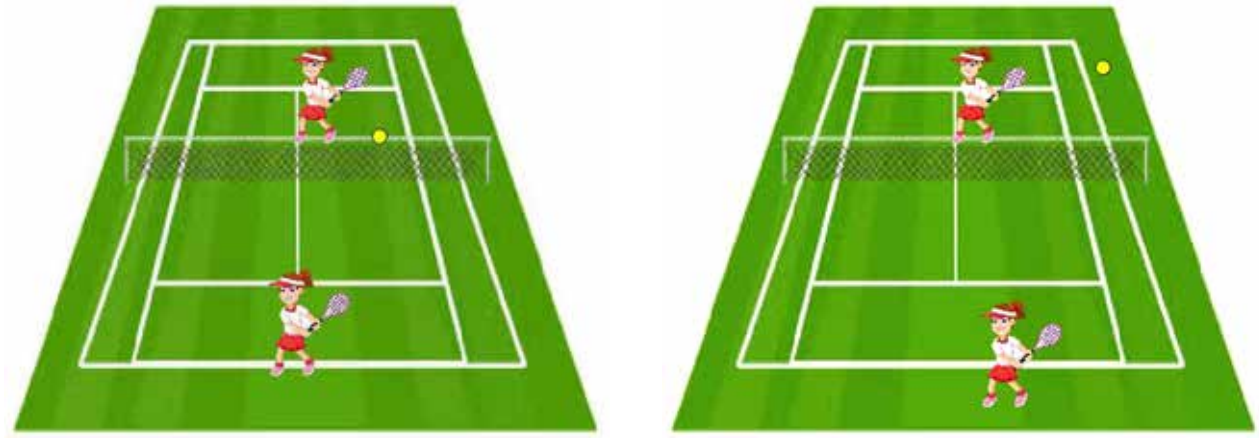

Fig. 4. Animation illustration of a tactical interaction "The Lob"

4. The program "Macromedia Flash 8" was used to create the animation.

After the experiment, psychophysiological and technical-tactical testing data were obtained. Comparison of the mean values of test parameters showed that the psychophysiological parameters of the experimental group after the experiment improved while the control group testing performance has improved improperly or not so obviously as in the experimental group, as described in Table 1.

The results of psychophysiological testing show that as a result of the introduction of tactical

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Table 1

Indicators of psychophysiological testing of tennis players of the experimental and control groups before and after the experiment

Indicators	Group	Experiment	Statistical values of indicators				
			X	S	m	t	p
Tapping test, ms	Experimental	before	15,92	2,35	0,68	1,49	0,15
		after	17,17	1,70	0,49	1,49	0,15
	Control	before	17,08	2,71	0,78	0,62	0,54
		after	16,42	2,54	0,73	0,62	0,54
Reaction time to a light stimul, ms	Experimental	before	2,53	1,92	0,55	1,11	0,28
	Control		3,30	1,42	0,41	1,11	0,28
	Experimental	before	13,57	2,96	0,86	0,84	0,41
	Control		12,52	3,16	0,91	0,84	0,41
	Experimental	after	3,40	1,43	0,41	0,25	0,81
	Control		3,55	1,38	0,40	0,25	0,81
	Experimental	after	14,11	2,68	0,77	1,13	0,27
	Control		12,74	3,23	0,93	1,13	0,27
Reaction time to the sound stimul, ms	Experimental	before	2,90	1,25	0,36	0,18	0,86
	Control		2,81	1,19	0,34	0,18	0,86
	Experimental	before	3,88	1,40	0,40	0,97	0,34
	Control		3,34	1,34	0,39	0,97	0,34
	Experimental	after	3,41	1,16	0,33	0,69	0,50
	Control		3,10	1,04	0,30	0,69	0,50
	Experimental	after	4,42	1,13	0,33	1,64	0,12
	Control		3,59	1,35	0,39	1,64	0,12

training techniques by using animated illustrations, the experimental group significantly improved the response time to a light stimul by 0.5 s on average and the response time to a sound stimul by 1.5 s on average, while the control group improved by 0.07 s and 0.6 s in the corresponding tests. Because of this the interest in animations has improved the concentration of tennis players and, accordingly, the quality of the exercises.

As can be seen from table 3, before the experiment the average values of the deep ground strokes, the ground strokes accuracy from the back line did not statistically differ between the control group and experimental players. In the initial testing, the mobility in players of the control group slightly exceeded (albeit statistically insignificant) the performance of the experimental group.

During the experimental period both groups improved indicators that characterize the effectiveness of strokes. As shown in table 3, after the experiment, the experimental and control groups began to differ noticeably from each other. In the experimental group, the total number of points was: the maximum value of 206 points for girls and 201 points for boys, and in the control group – 132 points for girls and 163 points for boys. The data obtained indicate a positive impact of the developed methodology on tactical training.

Table 2

Indicators of technical and tactical preparedness of tennis players of the experimental and control groups before the experiment

Test	Group	X	S	m	t	p
The deep ground strokes	Experimental	3,25	0,87	0,25	-4,28	<0,001
	Control	3,17	0,83	0,24	-1,79	>0,05
The deep volley	Experimental	2,92	0,79	0,23	-3,53	<0,001
	Control	2,75	0,45	0,13	1,43	<0,05
Ground strokes accuracy	Experimental	2,92	0,79	0,23	-4,42	<0,001
	Control	3,08	0,79	0,23	-1,11	<0,05
The serve	Experimental	2,92	0,79	0,23	-5,01	<0,001
	Control	2,83	0,58	0,17	-1,70	<0,05
Mobility	Experimental	3,76	1,25	0,36	0,61	>0,05
	Control	3,44	1,51	0,43	0,61	>0,05

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Table 3

Indicators of technical and tactical preparedness of tennis players of the experimental and control group after the experiment

Test	Group	X	S	m	t	p
The deep ground strokes	Experimental	4,50	0,52	0,15	-4,28	<0,001
	Control	3,67	0,49	0,14	-1,79	>0,05
The deep volley	Experimental	4,42	0,79	0,23	-4,63	<0,001
	Control	3,08	0,51	0,15	0,68	>0,05
Ground strokes accuracy	Experimental	4,33	0,78	0,22	-4,42	<0,001
	Control	3,42	0,67	0,19	-1,11	<0,05
The serve	Experimental	4,42	0,67	0,19	-5,01	<0,001
	Control	3,25	0,62	0,18	-1,70	<0,05
Mobility	Experimental	3,07	1,18	0,34	1,81	<0,05
	Control	2,65	1,09	0,31	1,81	<0,05

Conclusions. An analysis of the scientific and methodological literature shows the presence of certain difficulties in the tactical training of tennis players 10–12 years old. The difficulty of managing the training is that the player is opposed to the opponent, and he makes a specific decision depending on the game situation (the location of the team partners and the opponent, the direction of the ball, etc. [7, p. 40; 15, p. 820].

However, a significant role in tennis tactics belongs to the conscious ability to control, accurately evaluate and analyze actions. The correct distribution of movements in time, the exact differentiation of the duration and sequence of these movements, as well as compliance with a certain speed and maintaining the desired pace determines the success of the action. [14, p. 100; 8, p. 1445].

Tactical combinations in tennis are very variable. The tactics of a tennis player depends on the style of play. However, it is difficult for players aged 10–12 to develop their playing style due to psychological stress in competitions. Thus, the most effective is the use in games an advance automatically learned tactical combinations and actions.

In our work the effectiveness of applying the tactical training methodology for tennis players by using animated illustrations is proved. This technique allowed to improve the quality and accuracy of hits in a given area, and also contributed to a more rapid decision-making in game situations on the court.

The main conclusions of the work are:

1. The work presents the principle of visual training and uses an interactive method for solving tactical problems.

2. It is shown that the applied method of training tennis players has increased almost all indicators of testing special physical and technical-tactical preparedness, quality of performance of strokes.

3. The developed method has a positive effect on the accuracy of hits and the effectiveness of completing matches.

4. The developed technique is adequate for solving the problems of the training process for tactical training of tennis players 10–12 years old and can be recommended in the wide practice of training tennis players of the age category up to 10 years.

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