EFFICIENCY OF LEARNING PROCESS FOR BEGINNERS IN THE GAME OF TENNIS

ENE-VOICULESCU CARMEN[1], PANAIT LIVIU[1], CHELARU IOANA[1], CONSTANTINESCU LILIANA[1], FILIP ANDREEA GEORGIANA[1], CATANĂ COSMIN CĂTĂLIN[1]

Abstract
In this study we aimed to evaluate the extent to which learning basic strokes of tennis game becomes effective at the age group of 6 to 8 years, by applying specific methods and tools. Thus, in the operational approach of the study we assumed that the development and future appliance of specific algorithmic for learning basic strokes in the game of tennis will help efficiency of process training. Based on the objectives set out in the proposed experimental design we have set objectives and stages of research. Afterwards, we have established research methods and samples subjected to our study that children are starting to play tennis at age 6-8 years. In accordance with the training plan was applied the micro cycle training model, and the algorithmic systems were selected logical. Two batteries of tests (the general physical preparation and specific physical preparation) were applied in the two tests (initial, final). The results obtained showed statistically that the experimental group averages recorded results are significant at different thresholds of significance ($p < 0.025$, $p < 0.005$, $p < 0.0005$). Finally the appliance of training model in the training process led to an increase in the efficiency of learning the basic strokes in tennis at the age of 6 to 8 years.
KEY-WORDS: learning, efficiency, tennis, beginners.

Introduction

Tennis belongs to the large family of sports games, being an individual and team sport (doubles). Due to technical - tactical processes used during game by purpose in training and playing tennis is both a physical education too and sport, a sport. Movement technique is essential to ensure effective and successful in the game of tennis to develop an effective shot. Optimization of stroke biomechanics and movement is of particular importance, both in terms of performance and prevention of accidents and is as relevant for novice players as well as for professional players (Francesco, 2003).

In children younger than 10 years old who want to achieve maximum sporting potential it has to be increased the importance of learning ABC -'s (agility, balance, coordination) together with the physical skills of running, jumping, throwing and catching (Balyi and Hamilton , 2003).

In learning methodology on all three base strokes in introductory courses, it is recommended the use of practice proven methods with good results on acquiring accurate and easy basics of hitting.

In the learning process, strokes are approached in a specific sequence. Thus the recommended learning is forehand, backhand and last, serves. Having in mind that each shot consists in a number of shares of body segments in learning, these actions are addressed in a specific order (Schulz, 1993).

Dobos and Baciu, 2004 states: " Given the complex nature of strokes, the necessity of learning the correct and efficient execution of their learning process, consolidation and improvement is achieved in several stages:

● learning hitting mechanism
● strengthening and improving the game strokes in isolated conditions
● strengthening and improving the game strokes during action
● verification and themed game "

Learning striking mechanism is charged with striking movement habits, recommending exercises that are using the following sequence:

➢ preparatory exercises with ball and racket
➢ imitation exercises
➢ exercises on offered ball
➢ exercises with the ball thrown by the coach. In early learning skills the coach insists on actual stroke followed by the end of the stroke and preparation.

Initiation of the group can begin when a child may fall within a program group and the individual initiation by a foreign person can be started when child development stage does not limit the possibility of communicating with people of customary entourage (parents, grandparents) (Schulz, 1993).

R. Schulz said: "Learning the game of tennis from start with pleasure may not influence the future development. The child will gladly go to court if the early hours did not seem too difficult and noted that he

[1]Ovidius Universsity Constanta, ROMANIA
Email: carmen.ene@univ-ovidius.ro

progresses over time, and he is appreciated. "These considerations may benefit from coaching following: Control the tennis racket, which must not be too large and too heavy.

The court is too large. To start learning phase three basic strokes played on a smaller area of court ("tennis on little court").

In young children, respectively in the first lessons and the games between beginners they use the ball of sponge (soft).

First learned basic strokes with proper technique are simple and effective (Schulz, 1993).

The basic technique of the two main strokes, right side stroke or forehand and left side stroke or backhand, is learned in the beginning on small court and by increasing the game distance continuously finally reaching the base line game. (Ene-Voiculescu, 2012)

Description of experimental design components:
Organization:

Research purposes: we watched if learning process of basic strokes in tennis game becomes effective at the age group 6-8 years by applying specific methods.
Hypothesis: it is assumed that the composition and the appliance of specific algorithmic learning basic strokes systems in the game of tennis will help the efficiency of the training process.

Objectives:
1. Study of theoretical concepts and practical experience of field specialists that are interested in strokes learning process efficiency.
2. Parameters study that highlights general physical and specific physical preparation of tennis players at this level.
3. Develop a training program for efficient learning of basic strokes during a macro cycle, for kids tennis players at this age.
4. Theoretical considerations and experimental methodologies for an efficient learning.
5. Based on the analysis and statistical processing of research and find a model for efficient training of basic strokes in the tennis game.
Research methods applied were: bibliographic study, teacher observation, experiment teaching, tests with the following batteries:
Anthropometric tests: measurement of height, weight, length, upper and lower limbs.
Tests of general physical training: running speed (30 m), long jump, high jump, tennis ball throwing.
Specific tennis game tests: cross court, long line, and maintained forehand.

Results. Experimental study approach

Statistical and mathematical method by which the following parameters were calculated: arithmetic mean, standard deviation, coefficient of variation; significance difference between the means (Student t test).

Methods. Description of tests:
Speed running distance on 30m – Specific tennis test for players at this level. Speed was measured by timing the scroll distance for each subject. Start was made from standing position on audible signal (whistle). There have been two attempts and best time was recorded.
Long jump
Was measured horizontal push power (cm) by standing long jump and we recorded best value of two trials?
Explosive power
Standing high jump with both feet; near a wall the athletes are trying to touch the wall as high as they can.
Tennis ball throwing
Throwing runs in place with one hand, carrying the only 2 attempts.
Cross court
The player behind the base line is playing the ball diagonally across the court, where a square of 1 meter is drawn, each player having 20 forehand shots.
Long line
Player is behind base line, is was forced to send the tennis ball along the line to the other side of the court, into a square of 1 meter, each player having 20 forehand shots.
Forehand maintained
The player will play forehand into the opponent's court until the first mistake.
Experimental design used in research practical design
Research subjects, the venue and stages of research:
FIRST STAGE: includes bibliographic study of all authors in the literature of the field. This phase lasted from 15th of March to 15th of June 2012.
SECOND STAGE: lasted from 20th of June to 25th of July 2012 in which we chose as research subjects the beginners kids from Laguna Sports Club, Constanta, age group 6-8 years (12 boys). Half were experimental group and half controls. We have elaborated chose and applied a series of anthropometric tests, for the general physical preparation in tennis at initial testing. Work preparation process took place in Queen Mary school gym and sports field of Samtronic Mamaia, Constanta.
Third stage: corresponded to the period 25th of July 2012 – 20th of January 2013 in which was designed and implemented the new program designed by us to increase the efficiency of training process in learning basic strokes in the game of tennis at the age 6-8 years. Also during this period, in the end there were applied again batteries of tests (final testing).
In the process of training during the experimental study we applied a specific training model for this age group (Table 1)

TABLE nr.1 Micro cycle training model applied in the practice process for the two groups of experimental and control subjects. Analysis of the results for all the parameters studied is shown in the tables that follow.

Day	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sudnay
Am	L.D.1 20L L.S.1 4x20L	Free	L.D.2 4x20L L.D.4 4x20L L.S.3 4x20L	L.D.5 4x20L L.S.5 4x20L	Free	L.D.2 4x20L L.S.3 4x20L L.D.5 4x20L L.S.5 4x20L	L.D.1 20L L.S.1 4x20L L.D.4 4x20L L.S.2 4x20L
Pm	L.D.1 20L L.S.1 4x20L L.D.4 4x20L L.S.2 4x20L Motion games	Free	L.D.2 4x20L L.S.3 4x20L L.D.5 4x20L L.S.5 4x20L S1 4x20L Motion games	Free	L.D.4 4x20L L.S.2 4x20L S2 4x20L Motion games	Free	Free

The presented micro cycle training plan during 12 to 18 September 2012 contains the number of hours of training per day on court for tennis players aged 6-8 years. In tennis drills were introduced specific drives expressed by algorithms designed for forehand (LD), backhand (LS) and serve (S).

1. Forehand
L.D.1 – imitation forehand
L.D.2 – forehand long line and the try to hit standing cones
L.D.3 – forehand cross court and th try to hit standing cones
L.D.4 – forehand with the ball launched by coach
L.D.5 – mentaned forehand until mistake
JOC – tennis game
L.V. – Various shots forehand and backhand

2. backhand
L.S.1 – imitation backhand
L.S.2 – backhand with the ball launched by coach
L.S.3 – backhand long line and the try to hit standing cones
L.S.4 – backhand cross court and the try to hit standing cones
L.S.5 – mentaned backhand until mistake

3. service
S1 – sending the ball over the net into the opponent's court
S2 – sending the ball in one half of the service court.

Topics: Analysis and interpretation of data
Experimental data recorded during the study were processed, analyzed and interpreted in the final stage

In the speed running test on 30m, for initial testing of experiment group average was 6.29 sec., and the final testing average was 6.12 sec. Mean difference between final and initial testing is 0.17 sec., and coefficient of variation for both tests is homogeneous. Calculating the significance of the average experimental group there was a significant difference $t = 4.47$ to $p < 0.0005$. **In long jump,** for initial testing of experiment group average was 1.18 m and 1.23 m final, mean difference between final and initial testing is 0.05 m, and the coefficient of variability of both tests is homogeneous. Calculating significance of difference between the average experimental group there was a significant difference $t = 2.39$ to $p < 0.025$

In high jump (explosive power) for initial testing of experiment group average was 25.65 cm., and the final of 28.33 cm. Mean difference between final and initial testing is 2.68 cm., and coefficient of variation for both tests is relatively homogeneous. Calculating significance of difference between the average experimental group there was a significant difference $t = 2.1$ to $p < 0.025$, from initial testing to final testing.

For the experimental group throwing a tennis ball, initial testing average was 13.13 m and 15.56 m final, the mean difference between final and initial testing of 2.43 m, and the coefficient of variation in initial testing is homogeneous and the final is not homogeneous. Calculating the significance of the average experimental group there was a significant difference $t = 5.24$ to $p < 0.0005$.

Table nr. 2 Analysis of the results achieved in the physical preparation of athletes parameters (experimental group) tested during the experiment (initial and final stage)

Nr. Crt.	Tested parametres	Testing		Statistical criteria			
				C.V.%			
		Initial $\overline{X} \pm DS$	Final $\overline{X} \pm DS$	T.I.	T.F.	t	p
1	Speed running 30m (sec.)	6,29±0,52	6,12±0,49	8,04	7,82	4,47	P<0.0005
2	Long jump (cm)	1,18±0,04	1,23±0,04	3,44	3,25	2,33	P<0.025
3	Détente (cm)	25,65±3,5	28,33±3,13	14,19	11,45	2,1	P<0.025
4	Throwing a tennis ball (cm)	13,13±1,39	15,56±0,75	2,97	26,59	5,24	P<0.0005

As shown in Table 3, **forehand cross court on target (20 hits),** for initial testing experiment group average was 7.16 hits, and at the end 9.86 hits. Mean difference between final and initial testing was 2.70 strokes, the initial testing variability coefficient is inhomogeneous, and the final is relatively homogeneous. Calculating the significance of the average experimental group there was a significant difference t = 5.27 to p <0.0005. **Forehand long line test on target (20 hits)** for initial testing experiment group average was 7.83 hits, and at the end of 10.28 hits. Mean difference between final and initial testing is 2.45 hits, and coefficient of variation for both tests is inhomogeneous. Calculating the significance of the average experimental group there was a significant difference t = 2.45 to p <0.025. For the experimental group, maintained forehand (20 hits) on initial testing average was 7.54 hits, and the final testing of 11.23 hits. Mean difference between final and initial testing is 3.69 hits, the coefficient of variation in initial testing is inhomogeneous, and the final is relatively homogeneous. Calculating the significance of the average experimental group there was a significant difference t = 3.53 to p <0.0005.

Table nr. 3 Analysis of results achieved in specific physical preparation parameters of athletes (experimental group) tested during the experiment (initial and final stage)

Nr. Crt.	Tested parametres	Testing		Statistical criteria			
				C.V.%			
		Initial $\overline{X} \pm DS$	Final $\overline{X} \pm DS$	T.I.	T.F.	t	p
1	Forehand cross court at target (20 hits)	7,16±1,46	9,86±1,2	20,39	12,42	5,27	P<0.0005
2	Forehand long line at target (20 hits)	7,83±3,42	10,28±2,6	43,67	26	2,45	P<0.025
3	Mantained forehand	7,54±1,74	11,23±1,74	23,73	18,64	3,53	P<0.0005

As shown in **Table 4**, for the experimental group at initial testing in **speed run distance of 30m**, the average was 6.28 sec. and the final of 6.20 sec. Mean difference between final and initial testing is 0.08 sec, and the coefficient of variation for both tests is homogeneous. Calculating the significance of the average experimental group there was a significant difference t = 1.65 to p <0.0005.

In long jump initial testing average for the experimental group was 1.17 m and 1.19 m in the final. Mean difference between final and initial testing is 0.02 m, and the coefficient of variation is relatively homogeneous in both tests. Calculating the significance of the average experimental group there was a significant difference t = 2.47 to p <0.0005.
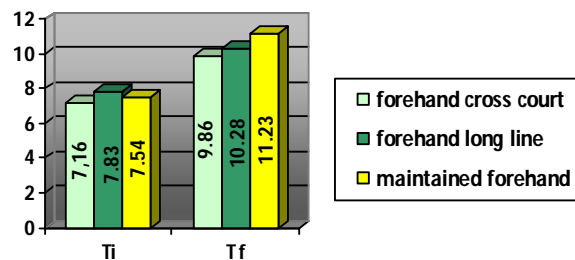
Figure 1. Dynamics of the experimental results achieved by the subjects during the experimental study
From the graphical representation (Figure 1) we can see the differences from one test to another for recorded performance of subjects experiment sample in the specific physical training test. RESULTS differences recorded averages highlights the effectiveness of the model in preparation for children beginners.

Table nr. 4 Analysis of results achieved for physical preparation parameters of athletes (control group) tested during the experiment (initial and final stage)

Nr. Crt.	Tested parametres	Testing		Statistical criteria C.V.%			
		Initial $\overline{X} \pm DS$	Final $\overline{X} \pm DS$	T.I.	T.F.	t	p
1.	Speed run on 30m (sec)	6,28±0,34	6,20±0,41	5,41	6,61	1,65	P>0.05
2.	Long jump (cm)	1,17±0,18	1,19±0,18	14,63	14,4	2,47	P>0.05
3.	High jump (cm)	26,5±5	27,83±4,26	18,86	15,3	1,06	P>0.05
4.	Throwing tennis ball (m)	12,89±2,6	13,38±2,11	20,17	15,76	1,27	p>0.05

In high jump (explosive power measured in centimetres), for initial testing experiment group average was 26.5 cm., and the final was 27.83 cm. Mean difference between final and initial testing is 1.33 cm., and coefficient of variation for both tests is relatively homogeneous. Calculating the significance of the average experimental group there was a significant difference t = 1.06 at p> 0.05.

For the experimental group for **tennis ball throwing test (m)**, initial testing average was 12.89 m and 13.28 m final at the mean difference between final and initial testing of 0.48 m. The coefficient of variation in initial testing is inhomogeneous, and the final is relatively homogeneous. Calculating the significance of the average experimental group there was a significant difference t = 1.27 at p> 0.05.

Tabel nr. 5 Analysis of results recorded parameters for specific physical preparation of athletes (control group) tested during the experiment (initial and final stage)

Nr. Crt.	Tested parametres	Testing		Statistical criteria C.V.%			
		Initial $\overline{X} \pm DS$	Final $\overline{X} \pm DS$	T.I.	T.F.	t	p
1	Forehand cross court on target (20 hits)	7,16±1,46	8,66±1,2	20,39	12,42	1,92	P>0.05
2	Forehand long line on target (20 hits)	7,83±3,42	8,54±2,6	43,67	26	4,39	P>0.05
3	Mentained forehand	7,33±1,74	8,63±1,74	23,73	18,64	1,43	P<0.025

From the data recorded in Table 5 we can see that in case of **forehand cross court** test **(20 hits)** for the control group the average initial testing was 7,16 hits, and at the end was 8.66 hits. Mean difference between final and initial testing is 1.50 hits, the coefficient of variation in initial testing is inhomogeneous and the final is relatively homogeneous. Calculating the significance of the average experimental group there was a significant difference t = 1.92 at p> 0.05.\

Forehand long line on target (20 hits) for initial testing control group average was 7.83 hits, and the final testing was 8.54 hits. Mean difference between final and initial testing is 0.71 hits, coefficient of variation in initial testing is relatively homogeneous and the final is relatively homogeneous. Calculating the significance of the average experimental group there was a significant difference t = 4.39 to p <0.0005.

Maintained forehand (20 hits) for initial testing control group average was 7.33 hits, and the final testing was 8.63 hits. The same soft ball was used in the study of the beginners training by Francesco, R., 2003 and Steinhafel L., in 1995.

Mean difference between final and initial testing is 1.33 hits and coefficient of variation is relatively homogeneous at both tests. Calculating the significance of the average experimental group there was a significant difference t = 1.43 to p <0.025.

Conclusions

Bibliographic study allowed the development of structure and content of the training in the game of tennis at the age of 6-8 years;

By determining the levels of general and specific preparation were used general and specific physical preparation parameters specific to tennis game. Experimental results showed that at the age of 6-8 years children have a low level of physical preparation in the initial stage of the experiment. Development of a training plan and its implementation during a macro cycle led to improved results in the test subjects' general physical training as follows:

The long jump for the experimental group mean difference between final and initial testing is 0.05 m; there is a significant difference t = 2.39 to p <0.025 at final testing;

For height jump test the average difference between final and initial testing is 2.68 cm., and coefficient of variation for both tests is relatively homogeneous. Calculating significance of difference between the average experimental group there was a significant difference t = 2.1 p <0.025, from initial to final testing;

For the experimental group in throwing a tennis ball test, the mean difference between final and initial testing is 2.43 m and calculated significance of the difference between the average experimental group had a significant difference for t = 5.24 to p <0.0005.

At speed run on the distance of 30 m average difference between final and initial testing is 0.17 sec.; there is a significant difference t = 4.47 to p <0.0005 in final testing;

Training model application during training process caused an increase in the efficiency of learning basic strokes of tennis game so algorithmic systems that we have applied in preparing beginners tennis athletes has significant improvements in the group experiment in some tests as follows:

For forehand long line was an increase of 2.45 hits, t = 3.53 to be significant growth;

For forehand cross court was an increase of 2.70 hits, t = 5.27 to p <0.0005, being a significant increase;

For mentained forehand was an increase of 3.69 hits, t = 3.35 p <0.0005, being a significant increase.

Hypothesis that the composition and the application of specific algorithmic learning basic strokes of the game of tennis will help efficiency the training process were confirmed.

Bibliography

Balyi, Hamilton, 2003**,** Biomecanica tenisului , ITF.
Dobosi, S., Baciu, A., 2000**,** Caiet de lucrări practico – metodice , FEFS Cluj – Napoca.

Dobosi, S., Baciu, A., 2004**,** Curs pentru specializare , Cluj – Napoca.

Ene-Voiculescu, C., 2006**,** Tenis-îndrumar metodologic, Editura Ovidius, Constanţa.

Francesco, R., 2003, Itf, http://en.wikipedia.org/wiki/International_Tennis_Federation

Schulz, R., 1993, Să învătăm corect tenis de la initiere la performantă , Ed. Helicon , Timisoara.

Steinhafel L., in Training exercises for competitive tennis, Editura Meyer Verlag in 1995

Zancu, S., 1998, Tenis – Ghid practic pentru antrenori,parinşi şi jucători, Editura ARC, Bucureşti.

Zancu, S., 1998, Tenis – Tactica jocului de simplu, Editura Instant, Bucureşti.

www.sportscience.ro

www.opentenis.ro

www.tenis.info.ro

www.itf.com

http://www.tennisplayandstay.com/downloads/tennis-play-and-stay-seminar-london-2008.html

http://www.tenisdecamp.ro/antrenamente-tenis-online.php