

THE IMPACT OF THE METHODS THAT RESIDES FROM VIDEO/BIOMECHANICAL ANALYSIS ON «TOP SERVICE» IN THE GAME OF VOLLEYBALL (JUNIOR II)

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In this paper, we tried to emphasize the effects that video analysis has on the «top service» of the athletes that are practicing the volleyball game. In the purview pedagogical approach were tested initially and finally, a number of parameters. In all tests, the values obtained by the experimental group were better, $P < 0,05, 0.01$.
Keywords: video analysis, top service, pedagogical research, volleyball game.

In this paper, we tried to emphasize the effects that video has on top service. In the purview pedagogical approach were tested initially and finally, a set of parameters.

The research was conducted between August, 2013 and June, 2014, on a sample group consisting in 15 athletes, forming the experiment group of CSS Nicu Gane Fălticeni, and 15 athletes forming the control group of LPS Piatra Neamt.

Following this work we want:

1. Rationale theoretical and experimental verification of the effectiveness of the proposed experiment.

2. To prove that sport training develops multi-lateral capabilities of the athletes, regardless of the nature of sport they practice.

3. To appreciate the level of development of top service.

The pedagogical approach intended to implement, while preparing the experimental group, a number of video means which have resulted from a careful study of their influence on this group.

The methods used in the experiment are: literature review, experimental method, the video analysis method, graphical and tabular method.

Following the results of the experiment group, which are significantly higher than those expected, we find that the contribution of new means (video analysis) led to improved the performance, and the general index of motricity, we recommend that in the future to take account of this in planning the training of the athletes who play volleyball.

Introduction. The performance valences in the actual game of volleyball and is decided by the ability of the athletes to develop versatile skills. A very important role in this development has the top service.

According to some authors [2, 3, 4] the video/biomechanical analyze of the game of volleyball studies how muscle forces arise and also their mechanical characteristics; she tries to demonstrate the effectiveness of these forces and discover practical methods for increasing the yield, depending on the purpose of doing physical training.

We believe that biomechanics, the study of biomechanics and video analysis of human movement are the main contributors to the most important competent actions: qualitative analysis of human movement and in this context undoubtedly the

top service is conditioned by applying them in the game of volleyball.

To emphasize the importance of video and biomechanical analysis, Berenstain N.A, quote by Castelman K.R. [2], has developed a method called «ciclogrametriei». With this new method he obtained trajectories of bulbs point, being able to measure, in the same time, the distance between them. Specialists in the field [1, 3], in recent decades, consider that human motion analysis methods have developed considerably, especially with the advent of the computer that can interpret and process the data.

Constantin V. [2] highlights the fact that a digital analysis and imaging system It is functionally composed of a small number of blocks. Thus, the imaging system (lens cameras) that collect electromagnetic radiation of the object studied, forming the image features of interest, working with radiation converter that converts electromagnetic radiation from the image plane into an electrical signal.

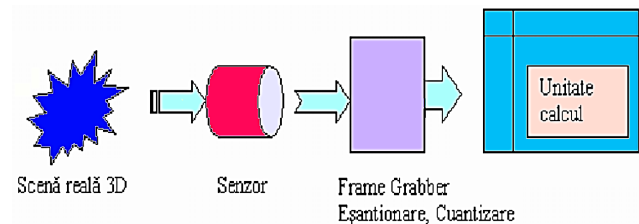


Fig. 1. Scheme of analysis and image processing after Constantin V. [55], as amended by us

Hypothesis. We started from the premise that if we are implementing in the game of volleyball methods that reside from video/biomechanical analysis, we will achieve positive results for top service.

Work tasks:

Following this work we want:

1. Rationale theoretical and experimental verification of the effectiveness of the proposed experiment

2. To prove that sport training develops multi-lateral capabilities of the athletes, regardless of the nature of sport they practice.

3. To appreciate the level of development of top service

Material-method. Our research was conducted in the period August 2013 – June 2014 on a sample

group n=15 athletes in the experiment group, CSS «Nicu Gane» Fălticeni, n=15 athletes in the control group, LPS Piatra Neamt.

The goal was to prove that thorough, versatile training, accomplished by means of video and biomechanical analysis, positively affects performance, both in the technical, as well as physical sphere, maximizing the results, at the technical process, «top service». For that we used a program named «Tracker». In the picture below we can see a snapshot of the program.

In the follow, we will present the technical description of the service in volleyball game, accepted by most specialists.

First position – Stand with your feet about shoulder width apart. the foot opposite of your hitting hand is placed in front of the other foot. The shoulders and hips should be aligned with the net. Make you sure your knees are bent. It is extremely important that your weight is on your back foot.

A server's posture is one of the most important parts of her serve. The power of the serve isn't from upper body strength, but from the legs. A powerful serve is achieved by being able to transfer weight from the back foot to the front foot correctly. Getting a strong starting posture is pivotal to a strong serve.

Second position – Hold the ball in front of you. Place your non-dominant hand directly in front of you, straight but with a flexible elbow. The palm should be face up with the ball in it. Another way to set up is to cover the ball with your hitting hand.

Third position – Ready your hitting hand. Swing your serving arm back next to your head. Make sure that your elbow is pointing upwards and your hand is at or slightly above your ear. This stance opens your body.

Fourth position – Toss the ball into the air. Lift the ball with your palm about 18–36 inches (46–91 cm) in the air. Keep the ball in line with your hit-

ting shoulder and about 1 foot (0.3 m) in front of you so you can step into the serve. Your right hand should be at a 90 degree angle behind your body. Remember that you want your dominant hand to make contact with the ball just after it changes direction and begins to drop back down.

In some variations, the hitting arm is readied as you toss the ball up, not before.

Fifth position – Aim for your serve with your body. The majority of the power of your serve is gained from the legs as you transfer weight from your back leg to your front leg. To transfer your weight properly, make sure your starting position is correct. Add momentum by stepping forward with your dominant foot as you serve, transferring the weight forward for a powerful serve.

The ball will go where your hand and toes face, so aim your palm and toes for accurate shooting.

Sixth position – Hit the ball with the heel of your dominant hand. Lead with your elbow to bring your dominant hand forward. Smack the ball with the heel of your hand or the bottom of your palm. Don't hit the ball with your fingers or fist. Make sure your serving hand is slanted slightly upward. This will help loft the ball over the net. Aim for the middle of the ball to achieve the straightest trajectory for the ball. Stop the motion of your hand when you make contact with the ball.

In the purview pedagogical approach was tested initially and finally the top service, in 5 different stages.

The methods used in the experiment are: literature review, experimental method, the video/biomechanics analysis method, graphical and tabular method.

Research results. After implementing the new means, when we processed statistical and mathematical data obtained, we had the pleasant surprise to find that the parameters value obtained at the final testing by the experimental group are

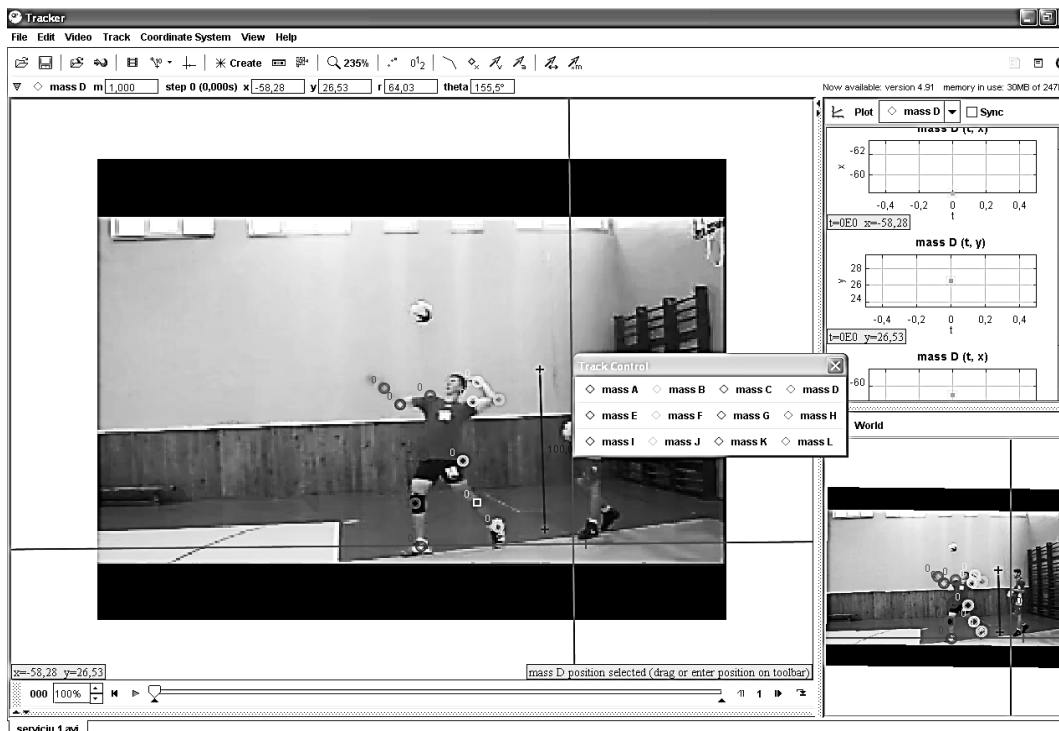


Fig. 2. Snapshot on «Tracker» program

better than that obtained by the control group. Table 1 shows the results of the two groups at the initial and final testing.

The above data can be transcribed in the chart below.

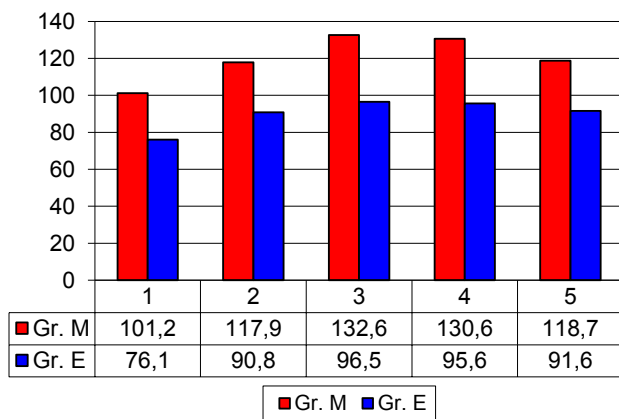


Chart 1. Summarizing the results (no. Errors) obtained by the two groups on techniques «SERVICE»

Statistically analyzing the differences between the final testing of the two groups in technical test, «Top Service», we note that «t» calculated is 4,00, higher than the «t» spreadsheet, $P < 0,01$

which shows that the differences between the two groups are significant in terms of value, in favor of the experimental group, as we can see in the table below.

Conclusions. As a result of research it can be concluded that:

Dynamics of the average values obtained by the two groups varies between initial and final testing.

Various means used in training of the control group made the progress visible.

Following the pedagogical approach, the majority of athletes in the experimental group had major improvements, both technical and tactical plan and physically.

Following the results of the experiment group, which are significantly higher than those expected, we find that the contribution of new means (video/biomechanical analysis) led to improve the performance, we recommend that in the future to take account of this in planning the training of the athletes who play volleyball.

We believe that the premise from which we started in the pedagogical approach has proven to be true, I recommend that all volleyball coaches should use these new methods because the qualitative and quantitative growth brought is in a relatively short time with minimal effort.

Table 1

Summarizing the results (no. Errors) obtained by the two groups on techniques «TOP SERVICE»

Technical process	THE PHASES OF TECHNICAL PROCESS										TOTAL MISTAKES		
	PHASE 1		PHASE 2		PHASE 3		PHASE 4		PHASE 5				
	Fundamental position		Shift to ball		Contact with the ball		Working arms		The work the other segments				
	No. of mistakes		No. of mistakes		No. of mistakes		No. of mistakes		No. of mistakes				
	Gr.M	Gr.E	Gr.M	Gr.E	Gr.M	Gr.E	Gr.M	Gr.E	Gr.M	Gr.E	Gr.M	Gr.E	
TOP SERVICE	T.I.	107,3	106,1	122,7	121,8	139,75	138,5	137,8	136,6	126,8	125,8	634,35	638,6
	T.F.	101,20	76,10	117,90	90,8	132,60	96,5	130,60	95,6	118,70	91,6	600,10	450,60

Table 2

Summarizing the statistic results obtained by the two groups on techniques «TOP SERVICE»

No.	Technical process	Groups and statistics	Statistical indicators			
			T.I. $\bar{X} \pm m$	T.F. $\bar{X} \pm m$		
1	TOP SERVICE	M	42,31±3,21	40,06±3,18	0,74	> 0,05
		E	42,04±3,22	30,04±3,14	4,00	< 0,01
		t	0,06	2,24	-	-
		P	> 0,05	< 0,0	-	-

Note: E – Experimental Group, M – Control Group

$n = 15$; $P = 0,05$; $0,01$; $0,001$. $r = 0,553$

$f = 28$; $t = 2,048$ $2,763$ $3,674$

$f = 14$; $t = 2,145$ $2,977$ $4,140$

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