

Pilot Study in Youth Volleyball: Video Analysis as a Didactic Tool

Studio Pilota nella Pallavolo Giovanile: la Video Analisi come strumento Didattico

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Abstract

Efficacy of the spike is important in volleyball score and efficiency of training process has a prior aim for coach, in the same time video analysis is used to purpose quantitative aspect of performance. Could be useful the use of performance as teaching method to improve single sport skills. The aim is to utilize this teaching methodology with visual feedback by video analysis to improve the technique model of spike. Methods is experimental and involve an under 21 women team, divided in control and experimental group, run of 10 training weeks while is going on the championship. Experimental group reviews itself by video without comments or helps of coach who evaluates specific technical aspects of spike by specific descriptors in check list of sport skill in presence of the athletes. The improvement of sports skills of control group is increased in minor percentage than of experimental group for difference of 12%. The different percentage could be attributed at the presence of the visual feedbacks in teaching training method. Data shows the future use of this tool in training and in physical education and not only for statistics or tactics scheme.

L'efficacia dello spike è importante per ottenere il punto nella pallavolo e l'efficienza del processo di allenamento ha un obiettivo prioritario per l'allenatore, mentre la video analisi può essere utilizzata come obiettivo per l'aspetto quantitativo delle prestazioni. L'utilizzo della video analisi potrebbe essere un fondamentale strumento didattico per migliorare le abilità sportive individuali. L'obiettivo è quello di utilizzare questa metodologia didattica con feedback visivo mediante la video analisi per migliorare il modello della tecnica dello spike. I metodi sono sperimentali e coinvolgono una squadra femminile di 21 anni, divisa in due gruppi uno di controllo e uno sperimentale; sono state utilizzate 10 settimane di allenamento durante il campionato. Il gruppo sperimentale esamina il video senza commenti o aiuti da parte dell'allenatore che valuta gli specifici aspetti tecnici dello spike dai descrittori inseriti nell'elenco di controllo delle abilità sportive in presenza degli atleti. Il miglioramento delle abilità sportive del gruppo di controllo è aumentato in percentuale minore di quello sperimentale con una differenza del 12%. La percentuale diversa potrebbe essere attribuita alla presenza di feedback visivi nella didattica del metodo di allenamento. I dati mostrano che questo strumento può essere utilizzato in futuro nell'allenamento e nell'educazione fisica e non solo per il sistema statistico o tattico.

Keywords

Physical Education; Sport; Didactics; Spike;

Educazione Fisica; Sport; Didattica; Spike

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Introduction

The sports training is usually carried out with the aim of improving performance. One of the variables that influence fundamentals learning is feedback. The feedback returns to athlete feedback information from the senses or from the outside world on a particular movement.

A source of feedback is given by the athlete's sensory channels (sight, hearing, touch), called intrinsic feedback. Even if some information from these sources are clear (for example, "the ball is out") often require athlete's experience (Best, 2010).

A second type of feedback usually comes from an outside source, usually a coach, and is designed to integrate intrinsic feedback. This information is known as extrinsic feedback and helps the athlete to compare what was done with what was intended. For more complex skills, it is believed that the extrinsic information accelerate the learning process and it may be necessary to help the athlete to achieve best performance levels.

The extrinsic feedback can be "given" to the athlete in two main forms: results knowledge and performance knowledge. In the first case the information is relevant to the gesture outcome or action outcome (notational analysis), while in the second case the information is relevant to the movement that led to that outcome (performance analysis). In the volleyball field, most of the feedback is provided verbally by the coach, or at least in the form of data thanks to scout the league matches (Alesi et al, 2014). Little is left to extrinsic visual feedback, using movies to analyze the performance of the motor gestures.

Furthermore, Hughes & Franks (2005) say that in many team sports, it is difficult for an observer to see and assimilate all the action taking place on the competition. It was noted that, because of coaches who are able to see only those phases of the game related to a specific stage, the most peripheral part of the game is lost.

So often, coaches are limited to base their feedback after the race on partial information of the team performance or individual athletes performance. Recent research, however, have shown if the feedback is objective and quantitative, the greater its effect on performance. The video analysis, ie the analysis of sports performance by watching the video, is used primarily for use in the quantitative performance of athletes through the notational analysis (Hughes and Frank). It may therefore be helpful to use and develop this methodology extrinsic-visual feedback given through the use of video analysis of motor gestures specific to Volleyball (Tursi, Napolitano, Raiola, 2013a).

Currently there are no specific studies about the use of performance analysis during training. The aim of this study is to verify whether this method can improve the performance of athletes, simply by reviewing their own movies while the performing of the particular "motor skills", so as to increase the awareness of oneself, of one's body, knowledge of the act.

Methods

The study is experimental. It provided the use of video analysis in training, with the aim to improve in particular a fundamental: the Spike.

12 athletes, women Under-21 are divided into two groups: a control group and an experimental group. The division is made with respect to tactical roles of each of the players. In this way, in each group there is the presence of: 1 setter, 2 outside hitters, 2 middle blockers, 1 opposite hitter (Napolitano & Tursi, 2013).

Both groups perform 10 weeks of specific training for the spike. Training sessions are held concurrently with the league, which includes 10 matches (one per week). The athletes are filmed at the beginning each training session, while perform the spike, first without the ball and then with the ball. Only the experimental group was given the op-

portunity, before each training session, to see their spike performance of the previous training session.

The coach does not affect the intrinsic visual feedback of the athlete, that reviewing himself, perceives in an autonomous way errors and weaknesses. Only during training the coach, in a prescriptive way, helps athletes with exercises, notes and extrinsic oral feedback (Tursi, Napolitano, Raiola, 2013).

With Kinovea, free and open source software, at the end of the project, is made comparison between first and last video clip, for each athlete and for groups, in order to verify the performance improvements, to note the differences between the groups, and also for get feedback on the effectiveness of visual feedback. In addition, the data retrieved with the software and the observation of the technical, are compared with the scouts results of the 10 league matches.

The spike consists of a sequence of elements: Optimum preparation for the hit on the ball, steps to spike, jump phase, Air Phase, hit on the ball, fall to the ground (Napolitano, 2014).

Optimum preparation for the hit on the ball:

Is all that precedes the run. It is position your body in optimal condition in relation to the trajectory of the ball, in order to perform the run more effectively. Being able to hit the ball making the most of the acceleration given by a good running start and the force of the blow of the hand is only possible if “we leave” and “jump” the right instant.

First step (left foot) and the next two steps (left-right): steps to spike

It ‘s the time when you buy the body horizontal speed. This speed must be as high as possible, but not such as to cause a loss of coordination of postural control. The race usually starts by one hitter with the forward movement of the right foot with a short and relatively slow step followed by a longer wheelbase and quick and concluded by a leap grazing, long and fast when the right and left foot coming in succession on the ground, with the left slightly more advanced to get a better balance.

Jump phase:

Is the movement in which the acceleration produced by the run is verticalized and transformed into jumping ability. The best jump takes place when it has an advance of the support to the ground of the heel. The barycentre of the body is in the retracted position and then lowered slightly to be projected upwards in the movement in which the foot leaving rolled, also in response to contemporary momentum of the arms from behind towards the front top.

Air Phase:

Is the next phase of the action of the upper limbs that brings the body to assume an arched position, in order to obtain a “pre-stretch” (abdominal and pectoral above) and a consequent greater development of transferable force on the balloon. The movement of the arm must be such as to allow hitting the ball at the highest point possible; the arm that does not attack rises first in the direction of the ball, while the arm that attaches carries a load to the top behind.

Hit on the ball:

Action that the hand performs at the moment of contact with the ball and which may be gender:

- Spike: the hand acts so as to cause an increase in speed by raising “whip” of the wrist.
- Lob: the shot is made only touching the ball with the fingers that are slightly open.
- Muffled: differs from spike as the final movement of the arm is voluntarily slowed down.
- Fall to the ground:

It is possible to make it less traumatic. This should be done on both toes at the same time. Following the damping action is completed thanks to a slight knee bend.

Results

The results showed the importance of video analysis training and visual feedback. All athletes are improved, thanks to the training program specific to the act of attack. The Experimental group, compared to the control group, is improved more, and in less sessions. Also scouts show a significant difference between the two groups of athletes.

The athletes of the Experimental group carried out the attacks of 12% more positive or “point”, respect to the companions of the other group. Everything seen from the films of comparison, the match video and data of the scouts. Linear regression showed a steady trend in the increase of skill in the succession of the training of the individual athletes.

Below, to simplify the discussion of the results, are taken as example 4 athletes. The latter have played by all the holders league games, and thus lend themselves well to our research work. Of these four athletes, two (a central and a spiker) belong to the group of control, and the other two athletes (a central and a spiker) belong to the Experimental group.

The athletes in the experimental group are shown in light yellow, while those of the control group with the color Blue In the first chart (Fig. 1) shows the results of the entire league scouts. In each mini table of each day, the attacks are reported in (#), the attacks positive (+) or not attacks replayed optimally adversary, attacks negative (-) re-played by the opponent, attacks wrong or walled (=). Finally, the positivity (Pos) or the sum of the attacks point and positive. At the end of each round, a table collects the total number of attacks and the number of attacks positive, with relative percentage. The same table is presented again at the end with the data of the entire league.

In the following graphs (Figure 2,3,4) will highlight the differences between the athletes, and the linear regression, namely the development of positivity of the attacks during the days of the championship.

Figure 1: Entire season scout

N	Athlete	1st Match				Pos	2nd Match				Pos	3rd Match				Pos
		#	+	-	=		#	+	-	=		#	+	-	=	
3	03-FabNik	4	4	6	3	8	7	4	9	2	11	8	10	3	2	18
5	05-MenAng	3	4	2	6	7	2	6	3	3	8	2	10	9	6	12
7	07-TopTer	3	2	0	2	5	3	1	0	1	4	2	2	1	1	4
10	10-EspMar	1	4	1	3	5	1	1	2	0	2	2	2	1	1	4
TOT		11	14	9	14		13	12	14	6		14	24	14	10	

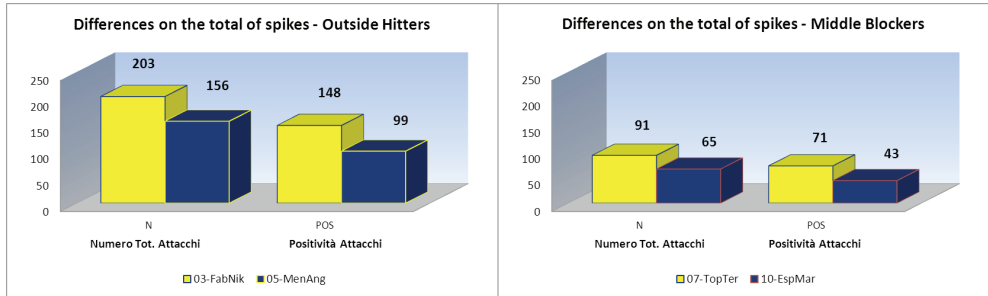
N	Athlete	4th Match				Pos	5th Match				Pos	Tot. First Round		
		#	+	-	=		#	+	-	=		N	POS	%
3	03-FabNik	7	8	4	2	15	11	4	6	2	15	106	67	63%
5	05-MenAng	5	3	2	0	8	5	5	4	3	10	83	45	54%
7	07-TopTer	4	2	2	2	6	3	3	0	1	6	35	25	71%
10	10-EspMar	3	1	1	0	4	4	1	3	1	5	33	20	61%
SQ TOT		19	14	9	4		23	13	13	7		257	157	

N	Athlete	6th Match				Pos	7th Match				Pos	8th Match				Pos
		#	+	-	=		#	+	-	=		#	+	-	=	
3	03-FabNik	10	9	3	2	19	5	8	0	1	13	7	10	3	0	17
5	05-MenAng	3	6	1	3	9	4	8	0	2	12	3	7	2	2	10
7	07-TopTer	3	4	1	2	7	3	6	0	1	9	6	5	1	0	11
10	10-EspMar	1	4	0	0	5	2	2	1	0	4	1	2	1	4	3
SQ TOT		17	23	5	7		14	24	1	4		17	24	7	6	

N	Athlete	9th Match				Pos	10th Match				Pos	Tot. Second Round			TOTAL Championship		
		#	+	-	=		#	+	-	=		N	POS	%	N	POS	%
3	03-FabNik	8	8	2	1	16	13	3	1	3	16	97	81	84%	203	148	73%
5	05-MenAng	5	10	4	1	15	4	4	1	3	8	73	54	74%	156	99	63%
7	07-TopTer	5	4	2	1	9	5	5	1	1	10	56	46	82%	91	71	78%
10	10-EspMar	3	3	0	2	6	1	4	1	0	5	32	23	72%	65	43	66%
SQ TOT		21	25	8	5		23	16	4	7		258	204		515	361	

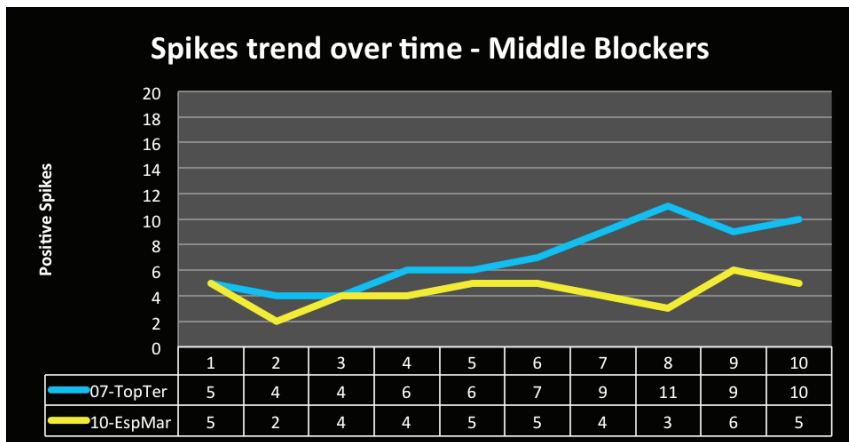
Source: Our Elaboration

Figure 2: Differences on the total of attacks for both outside hitters that for the middle blockers



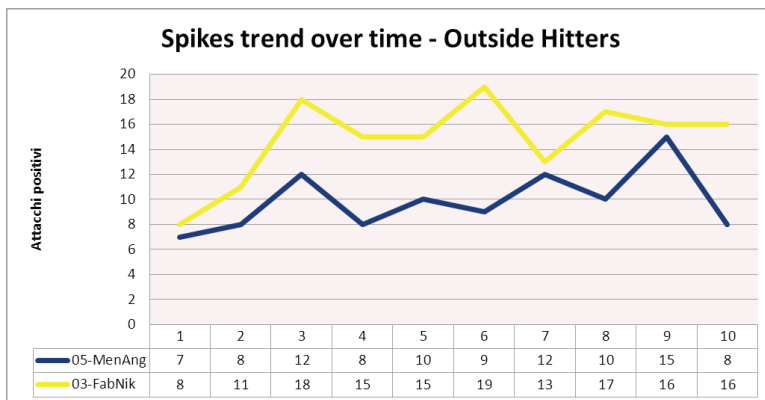
Source: Our Elaboration

Figure 3: Spiles trend over time – Middle Blockers



Source: Our Elaboration

Figure 4: Spikes trend over time – Outside Hitters



Source: Our Elaboration

Discussion and conclusion

These results open an interesting scenario with regard to the research on the effectiveness of video analysis training. It would be useful initially to compare this project with the previous one, to test for differences in learning motor skills, because in the former there was no presence of visual feedback of themselves (Ding & Fan, 2007; Napolitano & Tursi, 2013).

It would also be interesting to find the differences in improvement between the athletes who participated in the two jobs, because they are athletes of different ages. The results were evident in all the athletes. This has led the team to win the championship class played. In the regional finals which will be played at the end of May will be interesting to see whether this difference between the Control Group and Experimental Group has remained constant or increased / decreased.

The future goal is that to investigate this issue by investing other specific fundamental, to enter the video analysis in the theory of volleyball training.

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