

Documentation of Recent Trends in Volley Ball Through Video Analysis: A Study

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Abstract— The present study attempts to find out the recent trends in various offensive and defensive skills in volleyball. Mainly this study was concentrated in volleyball players and semifinal match of junior Men volleyball world championship 2010 held at pune were selected for research. Purely observation methods were applied with the help of video recording of concern match. The skills were used during match between two team were marked. Like that total which skill was used more for winning a match was analyzed. Through this analyzing we can measure the use of recent trends in various offensive and defensive skills in volleyball match.

Index Terms— Key words: Video analysis through video recording.

I. INTRODUCTION

Volleyball is a complex game of simple skills. It has come a long way from the dusty-old YMCA gymnasium of Holyoke, Massachusetts, USA, where visionary, William G. Morgan, invented the sport back in 1895. It has seen the start of two centuries and the dawn of a new millennium. Volleyball is now one of the big five international sports, and the FIVB, with its 218 affiliated national federations, is the largest international sporting federation in the world.

Over the last decade particularly, volleyball has witnessed unprecedented growth. With the success of its world competition such as the World Championships, Olympic Games, the US\$15 million World League, Grand Prix, World Cup, and World Grand Champions Cup, the level of participation at all levels internationally continues to grow exponentially.

Volleyball is an exciting and challenging sport that has developed into a premier interscholastic and professional spectator event. Understanding the rules, technical skills, and strategies of competitive volleyball is essential for its full appreciation. In theory, the objective of volleyball is to "ground" the ball on the opponents' side of the net. Accomplishing this objective in a consistent manner requires the highest levels of speed, agility, power, concentration and teamwork. This program introduces viewers to the fundamentals of traditional six-player volleyball. It begins with an explanation of the dimensions of the court, the essential rules of play, the basic strokes of the game, and the roles of the passers, receivers, setters, and spikers. Viewers learn the mechanics of the different types of service strokes, including the low security serve, the lateral serve, the tennis serve, the hook serve, and the jump serve, as well as the proper techniques for blocking and receiving the serve. European players demonstrate the precision hand and body movements required for ball handling and passing (including the basic pass, the hanging pass, and the back-set), plus

several exercise routines that help players refine their individual skills. Finally, viewers see the importance of proper player positioning as they learn basic and advanced team formations and dynamic rotation schemes designed to integrate individual skills into a unified, successful team effort.

The application of technology in the changing nature of sports can be classified broadly in two areas: Sport specific application mainly in the arena of sport equipments the use of path breaking technological advancement in sports It is absolutely safe to say that in the modern era sports, technology has played an important role in training and competition. This has been possible through various ways and means like creation of new sports, the modern equipments, modern facilities used for conducting those sports, the equipment used by the sportsman and the safety quotient of those equipments, the training support, and computers and so on. However the use and application of technology in sports is also an expensive affair to deal with. And because of such high expenses the benefit of such technology is limited to the elite end of the hierarchy. But as more and more sportsman seeks out better facilities the trickledown effect can be felt among the sports arena in general.

The use of drugs in sport, and the use of technology in sport are both aiming to increase speed, competitive edge and spectator interest. Neither one of them are taking into consideration the traditional role that sport once had within society: sport as an amusement, diversion, fun or a simple past time.

All in all, it is quite hard to say whether we should be accepting these new technological advances or whether we should be sticking to the traditional model of sport. We are currently in the middle of both drug use and the use of new and innovative equipment as far as I can tell. Where are we going to progress from here? Are athletes actually going to put microchips in their brain in order to attain an athletic title? The future holds many options for the outlook of sport, and it will be interesting to address tradition in sport in the years to come.

II. REVIEW OF LITERATURE

Zerger, Maggie, M.S. (2008) the present investigation focused on movement in the game of sitting-volleyball with the US Paralympics Team. The purpose of the study was to assess the effectiveness of lateral, forward, and posterior hand placement and open and closed body position on speed of movement of sitting-volleyball players. The United States Paralympics Women's volleyball team volunteered for the study. The team was in training at the time. All subjects were studied at the University of Central Oklahoma Wellness Center located in Edmond, Oklahoma. All trials were filmed on a regulation sitting-volleyball court that was designated by the UCO Paralympics Training Coordinator. The independent variables for movement at the net in the two meter trials were open and closed body position and direction. Open body position was defined as the player's body facing the sideline with their shoulder to the net, when moving parallel to the net for two meters. Closed body position was defined as the player's body facing the net as they moved laterally for two meters. Hand placement and direction were the independent variables for the six meter movement trials. Forward and backward were defined as moving facing the sideline in front of them and then behind them. Hand position was defined as anterior, lateral and posterior.

ChengTu Hsieh, Heise. Gary D. (2006) numerous studies have shown that arm swing has a significant influence on jump height (e.g., Lees et al., 2004). These studies indicated that an arm swing increases the angular velocity and torque at lower extremity joints, COM height, and velocity at takeoff for a countermovement jump. Additionally, Hsieh and Heise (2006) found that arm swing was one of the most important factors which contributed to volleyball spike jump height.

Studies found that the takeoff velocity can be enhanced by 6-12% when comparing countermovement jumps with arm swing to no arm swing. Arm swing raised the COM height at takeoff by 2-3% when compared to no arm swing (Feltner et al., 1999; Harman et al., 1990; Lees et al., 2004; Ravn et al., 1999). Although these studies examined the effect of arm swing on jump height, few of them have examined the performance of the arm swing in different skill level players. Additionally, few of the volleyball coaching texts adequately explain the importance of arm swing for the volleyball spike jump.

Therefore, the main purpose of present study was to investigate the difference of arm swing performance patterns between advanced and recreational female volley ball players. Camera Volleyball net

Tillman, Mark D.et.al. (2004) volleyball has become one of the most widely played participant sports in the world. Participation requires expertise in many physical skills and performance is often dependent on an individual's ability to jump and land. The incidence of injury in volleyball is similar to the rates reported for

sports that are considered more physical contact sports. Though the most common source of injury in volleyball is the jump landing sequence, little research exists regarding the prevalence of jumping and landing techniques. The purpose of this study was to quantify the number of jumps performed by female volleyball players in competitive matches and to determine the relative frequency of different jump-landing techniques. Videotape recordings of two matches among four volleyball teams were analyzed for this study. Each activity was categorized by jump type (offensive spike or defensive block) and phase (jump or landing). Phase was subcategorized by foot use patterns (right, left, or both). Each of the players averaged nearly 22 jump-landings per game. Foot use patterns occurred in unequal amounts ($p < 0.001$) with over 50% of defensive landings occurring on one foot. Coaches, physical educators, and recreation providers may utilize the findings of this inquiry to help prevent injuries in volleyball.

Markus, Tilp.et.al. (2006) the purpose of the study was twofold: (a) to create a useful tool for the analysis of beach volleyball and (b) to make a structure analysis of this type of sport. Therefore, the authors adapted the video analysis software called StatShot to investigate the U18 and U21 world championships 2003. Videos recorded during the competitions have been analyzed. The output of the research is a statistical summary on the used volleyball techniques connected to the corresponding video scenes. This connection should ensure the practical wealth of this method for the athletes as they have a complete game statistics and can study themselves or their opponents. This possibility improves the applicability of a classical quantitative analysis. The method was tested and showed good values regarding reliability and objectivity. The validity is given as the results have been successfully used and accepted by the Austrian national team trainer during competition. The structure analysis showed some interesting details in the game structure of U18 and U21 world class beach volleyball which are summarized within this paper.

Maria Tsivika , Papadopoulou Sophia D. (2008) the aim of the present study was to evaluate the technical and tactical offensive elements of the National Teams participating in the Men's European Volleyball Championship 2005. The study sample included 15 games between the teams of Serbia-Montenegro, Spain, Greece, Czech Republic, Holland and France. In total, 2667 serves and 3280 spikes were examined. The study was conducted with the use of the Sportscout monitoring and video-analysis program and for the analysis of results the statistical software package SPSS v.s. 12.0 was applied.

III. METHODOLOGY

The present study attempts to find out the recent trends in various offensive and defensive skills in volleyball. Mainly this study was concentrated in volleyball players and semifinal match of junior Men volleyball world championship 2010 held at pune were selected for research. Purely observation methods were applied with the help of video recording of concern match. The skills were used during match between two team were marked. Like that total which skill was used more for winning a match was analyzed. Through this analyzing we can measure the use of recent trends in various offensive and defensive skills in volleyball match.

IV. SOURCE OF DATA

The source of data collected for the present investigation from junior Men volleyball world championship held at pune, in the year 2010. The competitive semifinal match of the tournament was selected for this study. The logic behind analyzing the junior Men's volleyball world championship matches was that the matches would be of highly competitive level and that the matches would give a true representation of the skills that the investigator proposed to observe and analyzed in the present study.

V. TOOLS USED FOR THE STUDY

In any sport the analysis and evaluation of performance is beset with problem due to the number and diversity of playing actions, skills and complexities of performance. Therefore the exact and entire measurement of all skills actions and the team's performance in a competition becomes very difficult. A quantitative analysis with the objective, reliable, recording device/method for example, a checklist, computerized recording video analysis performance, statistical analysis etc appears to provide the most useful record of performance. Computerized recording, video analysis and sophisticated recording devices & methods were beyond the reach of the investigator. Hence, the investigator decided upon a checklist and digital video display of recorded performance of the match to the observed and analyzed, for the purposes of

scoring and recording skill performance. The investigator in consultation with the guide and other specialist & framed a checklist. The checklist was very simple. It contained the names of the entire major skills of the left hand side with their subdivision, wherever necessary. It was made simple enough that the scores derived from skill occurrence or performance match could to be entered easily in the checklist.

The data required for the preset study were obtained by observing and analyzing the digital video display of recorded performance of team that participated in the junior men volleyball World Championship 2010.

VI. COLLECTION OF DATA

The video recorded cassettes of performance of the team were analyzed and observed. The match were observed and analyzed for skill performance by the investigator himself. The skills were observed in slow motion whenever necessary. A 'tick' mark would be put against the skills as and when it occurs against the skill in the column of the skill. The frequency tally for occurrence of each skill would be completed for set and subsequently, all the sets observed for analysis. A total of 5 sets were observed for skill performance. This frequency tally of skill performance in the quantified form (numerical data) represented data for the present study.

VII. EXPERIMENTAL DESIGN

This study was formulated as a random group design consisting of observational method. The subjects were elite volleyball players those who participated in junior men volleyball world cup 2010 held at pune. Semifinal match selected for analyzing the recent trends in various offensive skills in volleyball. With the help of video recording only.

VIII. ANALYSIS AND INTERPRETATION OF DATA

The purpose of the study was to determine the recent trends in volley ball through video analysis. To achieve this purpose the performance of the team were analyzed and observed and the results are presented in this chapter.

For this study highly competitive semifinal match of the tournament was selected. The data was observed and analyzed in the standard procedure.

Below the tables and diagrams shown the team strength and weakness of his skill performance during the semifinal match of the tournament.

A. Mistake Committed In 1st Set

Sl.No	Particulars Of Mistake	Percentage
1	Service Fault	8
2	Blocking Fault	24
3	Attacking Fault	20
4	Defence Fault	48
5	Setting Fault	0

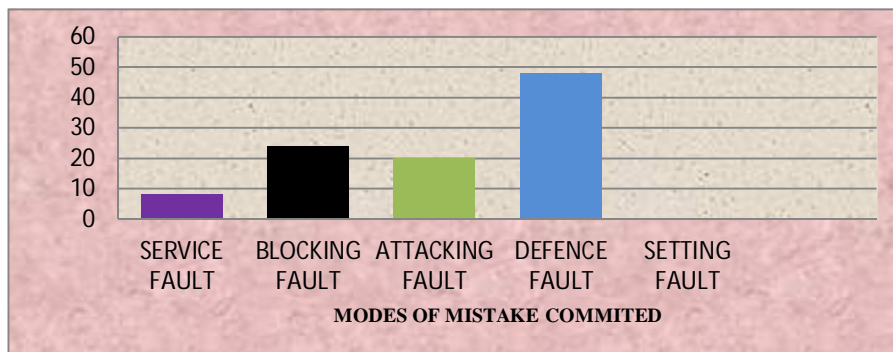


Fig.1 Mistake committed in 1st set

Figure-1 it is clearly shown that the mistakes committed in the first set and modes of mistake committed in first set and it is clearly shown that in which mode more mistakes are committed. It shown that by defense fault (48%) highest mistakes are committed followed by blocking (24%), then by attacking (20%), then by service (8%) modes mistakes are committed. So on the basis of faults identified in the present match, it is essential to reduce defense fault by specialized training.

B. Earning Points n 2nd Set

Sl.No	Particulars Of Mistake	Percentage
1	Tip	8
2	Wipe Out	28
3	Blocking	16
4	Service	12
5	Kill	20
6	Opp Error	16

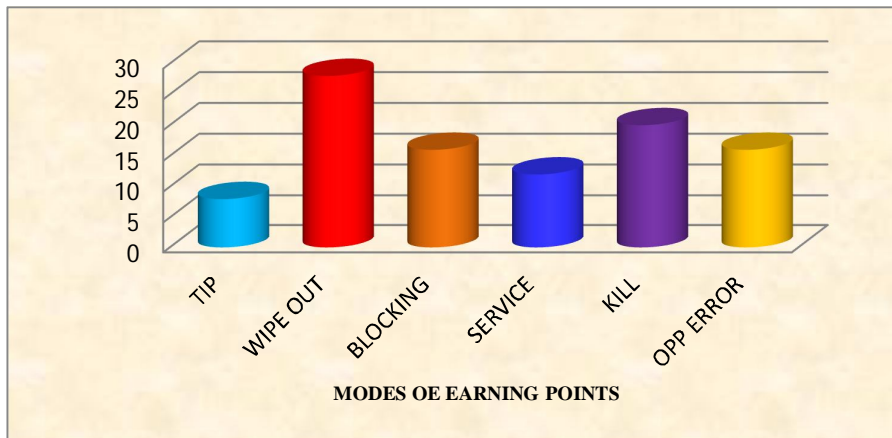


Fig.2 Earning points in 2nd set

Fig 2, it is clearly shown that the earning points in second set and modes of scoring points. And it has shown the mode in which based points are scored. Fig shows by wipeout 28% we have scored high points and followed by kill 20%, they by blocking 16%, then by opponent error 16% and then tip 8%, so on the base of present investigation it is found that the highest number of points is scored through wipeout 28%. This aspect has to be further refined in order use it. Whenever necessary has strength of a team on other hand tip 8% has been used in very little situation. This aspect has to be concentrated and improve in further matches.

C. Mistake Committed In 3rd Set

Sl.No	Particulars Of Mistake	Percentage
1	Service Fault	4
2	Blocking Fault	16
3	Attacking Fault	20
4	Defence Fault	60
5	Setting Fault	0

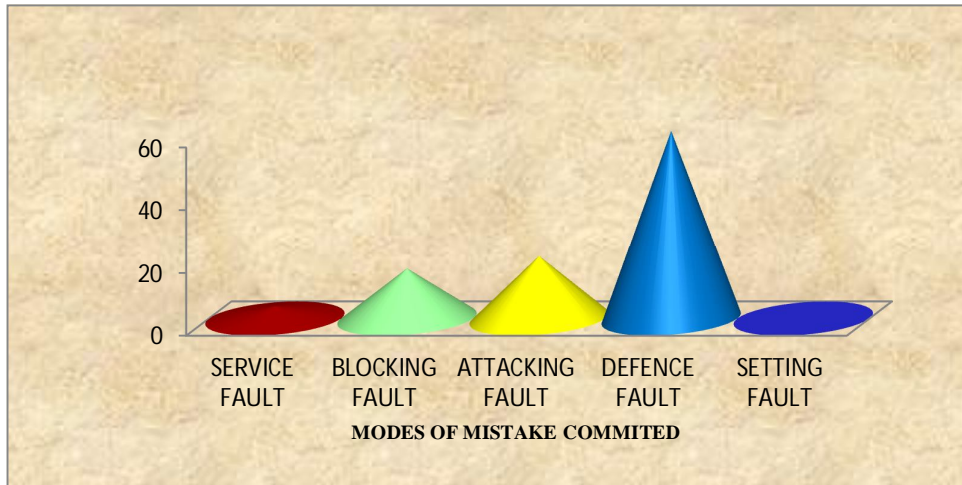


Fig.3 Mistake committed in 3rd set

Fig 3, it is clearly showed that the mistake committed in third set and modes of mistake committed in third set and it clearly shown that in which mode more mistake is committed. It shown that by defense fault 60% higher mistake are committed followed by attacking 20% then by blocking 16% and by service 4% modes mistake are committed so on the basis of faults identified in the present match, it is essential to reduce defense fault by specialized training.

D. Earning Points in 4th Set

Sl.No	Particulars Of Mistake	Percentage
1	Tip	4
2	Wipe Out	8
3	Blocking	12
4	Service	4
5	Kill	56
6	Opp Error	16

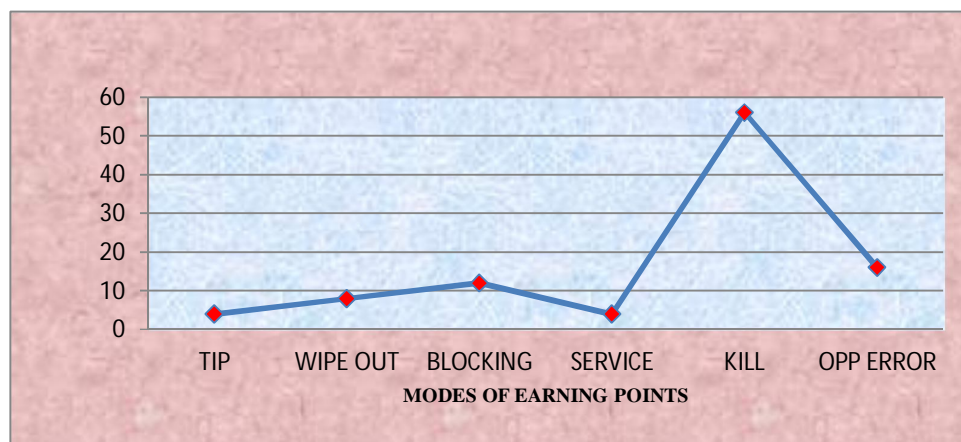


Fig.4 Earning points in 4th set

Fig 4, it is clearly shown that the scoring points in fourth set and modes in scoring points in set and mode in which shown the mode in highest points are scored. The fig shows by kill 56%, we have scored highest points and followed by opponent error 16%, then by blocking 12%, then by wipeout 8%, they by tip 4%. So on the basis of present investigation it is found that, the highest number of points is scored by kill 56%. This aspect has to be further refined in order to use it. Whenever necessary strength of a team on other hand tip 4% has been used in very little situation. This aspect to be concentrated and improve in further mistakes.

E. Mistake Committed In 5th Set

Sl.No	Particulars Of Mistake	Percentage
1	Service Fault	0
2	Blocking Fault	26.66
3	Attacking Fault	33.33
4	Defence Fault	33.33
5	Setting Fault	6.66

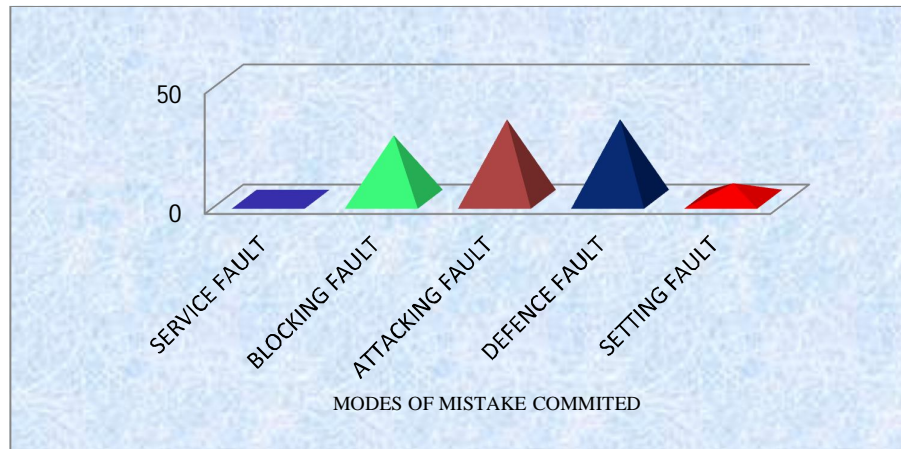


Fig.5 Mistake committed in 5th set

Fig 5, it is clearly shown that the mistake committed in fifth set and modes of mistake committed in the 5th set it is clearly shown that in which mode more mistake are committed that shown that by defense and attacking fault 33.33% highest mistake are committed followed by blocking 26.66% and then by setting 6.66% mode mistake are committed. So on the basis of faults identified in the present match, it is essential to reduce defense and attacking faults by specialized training.

IX. DISCUSSION ON FINDINGS

On the basis of results of the study, following observations were made and need further attention for study. India team lost the first set due to excessive defense faults which coasted heavily .defense is one of the prominent strategies to any team in order to be successful in a match. Brazilian team was too heavy for the Indian in the first set. In order to counter this problem India should have concentrated on defense. Due to India’s offensive strategy in the first set, it had to lose. In order to strengthen this aspect, a more intensive training has to be planned for improving defense.

In the second set, Indian team win the contest due to its attacking strength which concentrated heavily on wipe out followed by kill and block. Indian team in the present contest needs to improve upon serving and tip in order to use it effectively and timely.

Third set was lost by India due to defense faults which need adequate attention and innovative means for improvement.

Indian team regained the fourth set with a fight back mainly because of its ability to kill the ball. At the sometime error committed by opponent was a boon to the Indian team.

At the last, in deciding set India could not repeat its winning streak. Main reason for this may be attributed to attacking and defense faults, followed by illegal blocks. Weakness exhibited in attack has to be investigated

thoroughly in order to understand the probable reasons. Playing in pressure situation may not be habituated to Indian team.

Hypothesis formulated in the beginning of the study is fully accepted because through video analysis, the strength and weakness of Indian team were aptly reveal

X. SUMMARY CONCLUSION AND RECOMMENDATIONS

The study was conducted to determine the recent trends in volleyball through video analysis. It was mainly for measuring which offensive skill was more used for earning the points and which skill was least used. The concern of the study was found positive towards the hypothesis. Every result is shown accurately in Chapter IV (Analysis of Data & Interpretation) of the dissertation.

For concern study semi final match of the FIVB men's junior volleyball championship 2009 held in Pune (Maharashtra) India at Belewadi sports complex is selected. Data are collected with help of video recording of semi final match only. The executed skill was marked in particular sheets in chapter iv, the analysis was shown very accurately. Based on that result, this chapter was prepared. One more thing was kept in mind is that, data are collected from a match was skills executed and mistake committed. Total five tables are drawn in chapter iv and result are also mentioned very carefully. Table is separate made for five set. Finally the graphical representation of four major tables also drawn.

One more thing is that only offensive skills and mistake committed are taken are taken into particular study. Percentage of earned points and mistake committed in match are analyzed. Based on the calculated values result are shown positive towards the hypothesis of investigator.

XI. CONCLUSION

Within the limitations of the study the following conclusion could be reached from this research, they are; The results of various mode of earning points in percentage given below. In second set tip is 8; wipeout 28; blocking 16 services 12; kill 20; opponent error 16. In fourth set tip is for; wipeout 8; service 4; kill 56; opponent error 16.

The result of various modes of mistake committed in percentage were given below: In first set; service fault 8; blocking fault 24; attacking fault 20; defensive fault 48; setting fault 0. In third set service fault 4; blocking fault 16; attacking fault 20; defense fault 60; setting fault 0 and in fifth set service fault 0; blocking fault 26.66; attacking fault 33.33; defense fault 33.3 3 and setting fault 6.66.

The result of earn points by kill is 76%. This kill was executed more compared to other various offensive skills in this match. So result was positively supported to the given hypothesis.

The result of mistake committed by defense fault is more. This mistake was committed more compared to other various defensive skills in this match.

For this particular offensive skills and defensive skills result is also supported the hypothesis that mentioned in this study.

So based on this study, it was concluded that earn points from kill are more effective in this match.

RECOMMENDATIONS

- Similarly study can conducted in different age groups of those who are playing volleyball.
- Based on this study a volley ball player can execute the skills in particular match situation.
- Similarly study can conducted in various defensive and offensive skills in the volleyball match.
- Similarly study can conducted in other major games like Football, Basketball, Hockey, etc.,

These are the main recommendations based on this study to others. This study will give additional knowledge for researchers and volleyball players for future research and upcoming volleyball matches.

REFERENCES

- [1] Zerger, Maggie, M.S.2008, "A study of movement in sitting-volleyball" UNIVERSITY OF CENTRAL OKLAHOMA, 2008, 65,1454953.
- [2] ChengTu Hsieh and Heise, Gary D.2006 "ARM SWING OF VOLLEYBALL SPIKE JUMP PERFORMANCE BETWEEN ADVANCED AND RECREATIONAL FEMALE PLAYERS" University of Texas, Pan American, Edinburg, TX, USA, hsiehc@utpa.edu, University of Northern Colorado, Greeley, CO, USA, gary.heise@unco.edu .

- [3] Tillman , Mark D, Hass, Chris J. Denis Brunt and Bennett, Gregg R.2004 “JUMPING AND LANDING TECHNIQUES IN ELITE WOMEN’S VOLLEYBALL” , University of Florida, Gainesville, Florida, USA, Emory University School of Medicine, Atlanta, Georgia, USA, East Carolina University, Greenville, North Carolina, USA, University of Florida, Gainesville, Florida, USA.
- [4] Tilp, Markus; Koch, Christina; Stifter, Sibylle; Ruppert, Georg S. 2003 Digital game analysis in beach volleyball. “University of Wales Institute, Cardiff”.
- [5] MARIA TSIVIKA , PAPADOPOULOU SOPHIA D. 2008 “Evaluation of the Technical and Tactical Offensive Elements of the Men’s European Volleyball Championship” University of Thessaloniki, Greece.
- [6] Khitam Ay 2011 “The Effect of Visual Feedback on Learning Dive in Volleyball among Students of Physical Education in Jordan University”. An-Najah University, 25, 3, 2011, 0657-0688.
- [7] Rui Marcelino , Isabel Mesquita1 and Jaime Sampaio. “Efficacy of the Volleyball Game Actions Related to the Quality of Opposition” University of Porto,Portugal, University of Trás-os-Montes e Alto Douro at Vila Real, Portugal.
- [8] George Giatsis and George Tzetzis , 2003 “Comparison of performance for winning and losing beach volleyball teams on different court dimensions”.Aristotle University of Thessaloniki, Thessaloniki.
- [9] MAREK PAWEL PLAWINSKI, 2008. “AN ANALYSIS OF THE DIFFERENT SPIKE ATTACK ARM SWINGS USED IN ELITE LEVELS OF MEN’S VOLLEYBALL”. Queen’s University Kingston, Ontario, Canada.

BIBLIOGRAPHY

<http://www.sportsmetrics.net/wp-content/uploads/2010/02/Retention-Study.pdf>
<http://gradworks.umi.com/14/54/1454953.html>
<http://www.health.uottawa.ca/biomech/csb/Conference%20Proceedings/NACOB/Abstracts/306.pdf>
<http://www.jssm.org/vol3/n1/5/v3n1-5pdf.pdf>
<http://www.ingentaconnect.com/content/uwic/ujpa/2006/00000006/00000001/art00014>
http://ejmas.com/pt/2008pt/ptart_tsivika_0812.html