

Analysis of the role of mechanical variables in improving the accuracy of shooting by ascent in handball

Khaled Hamidat¹, Mohamed Guezgouz², Khaled Messaoudi³

^{1,2,3} University Center of El Bayadh; Contemporary Research Laboratory in Sports Training and Human Movements (Algeria).

Email: k.hamidat@cu-elbayadh.dz¹, m.guezgouz@cu-elbayadh.dz², k.messaoudi@cu-elbayadh.dz³

Received: 02-05-2024

Accepted: 22-12-2024

Published: 07-03-2025

Abstract:

This study aimed to identify the role of mechanical variables and their relationship to shooting accuracy in handball, focusing on the impact of certain kinematic variables on the skill of jump shooting. In order to answer the research questions, the study examined the differences in performance levels among central players using the "Hay and Reid" model through both qualitative and quantitative analysis, and whether there was any improvement in performance levels. To achieve the study's objectives, a hypothesis was proposed stating that there are statistically significant differences in the values of certain mechanical variables related to the execution of the jump shot in handball between the university center players, along with an observable improvement in the performance level of players in the Nour El-Bachir University Center team. The study was conducted on a sample of 12 players. Various tools were used to collect data, including academic references, previous and related studies. Two Sony cameras were used to visually record player performance, relying on objective observation through video recordings to analyze the mechanical variables using motion analysis software. After processing the data statistically using the Fisher test, the results showed an improvement in players' performance levels. Based on these findings, the study recommends adopting scientific methods when designing training programs, with particular attention to body angles during shooting, as they significantly impact shooting accuracy.

Key words: Mechanical variables - correction.

Introduction:

The world has witnessed tremendous scientific developments that have impacted all fields, and the field of sports education has had a significant share of this development. This impact is evident in the improvement of teaching and learning methods used in sports learning, in addition to the remarkable development in the level of sports in schools, as schools have become the platform from which sports champions emerge. This development is also reflected in the ever-increasing global records in various games and sporting events held during the Olympic Games and world championships. As a result of harnessing various other sciences, especially biomechanics, there has been a significant impact in improving and developing the level of technical performance and educational level of various sports. Najah Mahdi Shalash believes that "biomechanics is an important scientific tributary and a modern field among the many scientific fields that provide sports education

with objective and logical laws and explanations" (Shalash, 1988, p. 9). Rissan Khuraibat defines biomechanics as "based on the use of laws and principles used in biomechanics to study and analyze movement mechanically. The word 'analysis' is a method for understanding the behavior and path of human movement by dividing this movement into parts so that it can be studied individually and the relationship between the movement variables and the path it has taken can be determined. The movement under study is then converted into numbers and degrees. It also means the logical method by which the movement under study is approached as if it were divided into parts or basic elements" (Rissan, 1992, p. 28). Biomechanics is one of the sciences concerned with developing athletic movements through biomechanical study, analysis, and evaluation, clarifying differences and finding relationships through kinematic and kinetic analysis. In this regard, Wajih Mahjoub Jassim explains that "kinematics helps those working in the field of physical education choose the correct movements and the appropriate method, because the analysis provides solid and logical facts to support decisions" (Jassim, 1990, p. 15). This helps achieve the ideal technical performance of the skill, thus raising the athlete's level and achieving the desired goals of teachers, coaches, and educational institutions. Kinematics "is the science of describing movement in an abstract manner without addressing the forces that cause it. It is the science that studies movement generated by the influence of forces or the forces generated by movement" (Ali, n.d., p. 129). There are numerous studies in the field of biomechanics, particularly in the field of "kinematics." Shooting, especially the lob shot in handball, is a complex basic skill that influences the level of motor performance of students and pupils, due to the interconnectedness of the components of this skill. In order for these components or stages to be performed in a coherent and fluid manner, all the mechanical conditions accompanying their performance must be identified (critical observation of performance). Based on previous studies and the importance of understanding the mechanical conditions of the lob shot in handball, the research's significance lies in its adoption of cinematic kinematic analysis to study the lob shot skill in handball. Any failure in the technical performance of this skill by teachers can significantly impair proper learning of the skill. It is important to highlight the subtle differences that improve the skill, which may not be known to the Nour Al Bashir Al Baydh University Center student team, and to work on providing and equipping all students and teachers with sufficient information to make the lob shot process in handball and its mechanical variables within their awareness, and making this information readily available. In addition, the research aims to identify the differences in the values of some kinematic variables for the performance of the lob shot skill in handball among the players of the Nour Al Bashir Al Baydh University Center student team, as well as to identify the current level at the Nour Al Bashir University Center.

Research Problem:

The success of a physical education and sports teacher in teaching sports activities, specifically handball, depends on their mastery and solid understanding of the general basic principles of any sporting activity. Shooting is considered one of the most important of these principles, as it constitutes the finale of most sports movements. Therefore, it is essential to focus on this skill from all educational and training perspectives to raise the level of technical performance to an outstanding level.

The researcher noted a decline in the technical performance of the institute's students compared to other sports teams, in addition to a lack of information about the biomechanical variables of this skill.

Even the available information often lags behind modern developments. Therefore, the need arose to study the subtle differences in the mechanical variables associated with the performance of the lobbing skill in handball among the institute's students, to gain a more accurate understanding of these variables. The study includes a search for variables that can be studied to determine the level of the players, the method of studying this skill, and the errors that should be monitored during the teaching period of this skill according to the High-Ward model. It also examines the level of the center's students at various levels according to the analysis of the High-Ward model, and the significance of these levels in terms of both quantity and quality.

-Research objectives:

-To identify the differences in the values of some mechanical variables related to the performance of the lobbing skill in handball among the members of the Nour Al-Basheer Al-Baidh University Center handball team.

-To identify the level of the Nour Al-Basheer Al-Baidh University Center handball student team.

-Research hypothesis:

-There are statistically significant differences in the values of some mechanical variables related to the performance of the lobbing skill in handball among the players of the Nour Al-Basheer Al-Baidh University Center handball team.

-Improvement in the performance of the center's players.

- Procedural definition of research terms:

1- Biomechanics (Biokinematics):

This is the science of describing movement in an abstract manner, without examining the forces that condition it. It is the science that studies the movement generated by the influence of forces or the forces generated by movement for various sports skills through kinetic analysis.

2- Shooting with a Step-Up:

This type of shot is performed after a proper run, a good step-up on the offensive leg, and the ball is thrown during the step-up phase. Good concentration and a good running rhythm are required, which is performed in three times, which are odd in number, meaning (left, right, left) for a right-handed thrower and vice versa for a left-handed thrower. The center of gravity of the entire body is on the offensive leg (the pivot leg) during step-up. At the beginning of the three-time running rhythm, the throwing arm begins to move backward. During the dynamic step-up phase, the arm begins its final movement before throwing, and this only occurs at the peak of the step-up, with a focus on a slight bend of the second leg.

Previous Studies:

1- Hassan Abu Obeida's study (Obeida, 1993): entitled (Analysis of the Kinematic Characteristics of Three Selected Methods for Soccer Strike Skill 1993). The study aimed to analyze and compare three methods for striking the ball and identify the best of these methods in terms of ball speed and body movement mechanics. It also aimed to identify the most important factors affecting the performance outcome from a kinematic perspective during performance using cinematography and kinetic analysis. The research sample consisted of (30) players who were deliberately selected from Premier League football clubs during the 1992-1993 season. This study demonstrated the factors that influence the technical performance of these methods. It also extended to all those interested in the game of soccer, with specific average values for data on the kinematic variables affecting the performance of the skill at its various stages. One of the most important conclusions of the study is

the discovery of statistically significant differences between the three methods, which were found in favor of striking the ball with the front of the foot. 2- We find another study (Hajem Shani): (Shani, 2008): entitled: (A comparative study of some kinematic variables of the free throw among the teams participating in the West Asian Basketball Championship 2001). The study aimed to identify the difference in the values of some kinematic variables of the performance of the free throw skill in basketball among the teams participating in the West Asian Basketball Championship (Iraq - Iran - Syria - Yemen). The research sample was chosen intentionally and in a way that focused on the main players and the number of players was (16) players. Cinematography was used to measure the kinematic variables and the researcher followed the descriptive approach in the style of survey studies because it is the most appropriate approach that achieves the research objectives. Among the most important conclusions reached by the researcher are: - The emergence of statistically significant differences in the variables of the right and left knee joint angle at maximum flexion, the shoulder joint angle, and the elbow joint angle at the moment of scoring between the research sample teams, in favor of the Iraqi team. The researcher recommended: - Emphasizing the development of the elements of strength and speed due to the direct physical connection between them. This relationship leads to the optimal use of the generated energy; - Increasing the circumferential speed of the ball based on the principle of lengthening the radii of rotation as a mechanical principle; - The necessity for coaches to adopt mechanical principles and laws in training.

- Field Research Procedures:

- Research Methodology: In this research, we used a descriptive approach. Our study relied on objective observation using a video recording tape to record the data that the student researcher sought to observe and to find the angle values.
- Research Areas:
 - Spatial scope: Nour Al-Basheer University Center, Al-Baidh.
 - Temporal scope: Filming was conducted on the date of: during the 2020-2021 academic season.
 - Research Sample: The research sample consisted of 12 players from a football team. Hand to the Center.
 - Research Tools: To complete his research on grammar, the researcher used a set of tools, including:
 - Arabic and foreign sources and references.
 - A set of morphological and physical tests to isolate some critical variables.
 - The Hayward model for qualitative analysis of ascending aiming.
 - Determining the mechanical variables related to ascending aiming: The kinematic variables were determined from the Hayward model (Aar 08) from a theoretical perspective, according to the stages of movement, and also to compare, determine, or confirm the validity of the model through our experience. The stages were represented in four stages, as follows:
 - Kinematic variables for qualitative analysis:
 - A. From the Hayward model table.
 - B. Quantitative variables: Inference from the Hayward model and the educational observation model, "which is limited to description without delving into the details of treatment or behavior modification" (Tariq, 2005).
 - From professors, trainers, and experts (Professor Mokrani Jamal, Ghazal Mahjoub, Zarf Muhammad, Benbernou Othman, Ramoun Muhammad, Ahsan Ahmad, Ben Arabiya Muhammad, Zitouni Abd Al-Qadir, Abed Fouad from Mostaganem University) and from the definition of Zuhair

Al-Khashab and Maher Al-Bayani “This type of shooting is done after a proper run and good ascent on the offensive leg, and throwing the ball during the ascent phase, and good concentration is required. A good ascent for running, which is done in three times and is odd in number (left, right, left) for the right-handed thrower, and the opposite for the left-handed thrower. The center of gravity of the entire body is on the offensive leg (the pivot leg) during ascent, and at the beginning of the three-time running rhythm, you begin to move the throwing arm backward, and during the dynamic ascent phase, the arm begins the final movement before throwing, and this is only done at the top of the ascent, with a light focus on something for the second leg”: Handball: (Zuhair, 1988, p. 209) and it is:

First: The approach phase: - Approach phase time - Hip-to-torso angle - Tracking arm and hand movements.

Second: The take-off phase: - Phase time - Leg angle when leaving the ground - Free leg angle - Shoulder-to-torso angle - Forearm-to-humerus angle.

Third: The flight phase (shooting): - Phase time - Head-to-shoulder angle - Shoulder-to-torso angle - Forearm-to-humerus angle - Shoulder-to-torso angle from behind - Free arm-to-torso angle from the front.

Fourth: The landing phase: - Phase time - Leg-to-ground angle - Leg-to-ground angle.

Main experiment: The students filmed the take-off from a 9-meter area on October 10, 2021, and then analyzed the data over the next two months using a computer-generated motion analysis program (Kenova).

Cinematographic filming procedures: The researcher followed the following steps:

- Type of two cameras used: (Sony).

- The student researcher used two perspectives for filming, depending on the nature of the problem.

Therefore, the locations of the cameras and indicators were as follows: (- Distance of the side camera from the outlet: 9.80 m, - Distance of the front camera from the outlet: 6.70 m, - Height of the two cameras from the ground: 1.40 m, - Distance of the take-off point from the goal: 8.0 m, - Distance of the take-off point from the landing point: 3.50 m, - Distance of the camera from the touchline: 9.5 m.

Illustrative figure:



Drawing No. (01): Shows the photography procedures.

- Statistical methods:

Arithmetic mean - Pearson correlation coefficient - percentage - standard levels)

-Presentation and discussion of the research results.

First: Pre-tests were conducted to isolate some random variables, represented by sample homogeneity tables. Random variables were isolated except for the accuracy measurement variable. We found that the first group outperformed the second group. This difference and superiority will be demonstrated through qualitative and quantitative analysis of the mathematical skill (shooting by elevation). In addition to the exploratory study, the (Hayorid) test was standardized and the kinematic variables were modified. The results were as follows:

-Presentation and discussion of the results of the convergence phase:

Table No. (01): Shows the results of the approach stage.

In the calculated	In the table	The second group		First group		Samples Analytical Skill	Types of motor analysis (qualitative or quantitative)
		A	S	A	S		
0,490	3.30	0,27	1,33	0,25	1,22	Approaching phase time	Quantitative analysis
3,232		19,63	56,41	20,39	34,50	Avoid approaching as much as possible and lean towards aiming.	Qualitative analysis
2,320		10,5	108	12,37	125	hip angle with trunk	Quantitative analysis
2,509		14,33	34,91	7,48	26,66	The throwing arm movement is not related to the running movement.	Quantitative analysis
1,990		1,26	1,83	0,49	2,62	Track arm and hand movements	Quantitative analysis

From Table No. (01): We find that all values are not statistically significant at the significance level of 0.05. This indicates the presence of homogeneity between the research groups at this stage, meaning that the level of players at this stage is equal.

- Presentation and discussion of the results of the ascension phase:

Table No. (02): Shows the results of the ascension stage.

In the calculated	In the table	The second group		First group		Samples Analytical Skill	Types of motor analysis (qualitative or quantitative)
		A	S	A	S		
5,065	3.30	0,49	0,20	0,037	0,22	Stage time	Quantitative analysis
2,100		20,40	69	25,21	59,50	Leaving the ground with the entire foot at the beginning of the moment of breaking contact with the ground	Qualitative analysis
2,25		11,02	32,50	7,59	41	The angle of the man when leaving the ground	Quantitative analysis

0,55	15,71	73,33	29,94	63,33	The free man is not likely to push up and forward with a slight bend.	Qualitative analysis
0,222	21,85	71,75	13,75	73,41	Free foot Corner	Quantitative analysis
3,021	10,10	77,08	15,33	63,75	The throwing arm's shoulder does not rotate slightly backward.	Qualitative analysis
2,48	19,44	94,33	14,63	103,49	Shoulder angle to trunk	Quantitative analysis
0,32	14,37	53,58	22,21	57,25	Bring the forearm closer to the upper arm with the throwing arm	Qualitative analysis
3,805	15,84	144,77	27,84	116,46	forearm-humerus angle	Quantitative analysis

From Table No. (02): We find that all values are not statistically significant at the significance level of 0.05, except for the values obtained from the stage time and the angle of the forearm with the humerus in the quantitative analysis. This indicates a lack of homogeneity between the research groups in the time of the ascent phase, the performance of the phase, and the angle of the forearm in the quantitative analysis, which is in favor of the first group, followed by the second group, which is considered a kinematic variable that led to an increase in the result of measuring accuracy in favor of the first group, because speed in the ascent phase gives you a greater height, which leads the player or student to expand the shooting angle and a greater flight duration, giving him more time to think and shoot well towards the goal, and as Saleh Abdel Aziz (Education and Teaching Methods) says: "The support must be strong and good in order for the ascent to be high, the speed when throwing" (Saleh, 1985, p. 46), which is consistent with the second similar study in the first kinematic variable (the angle of the right knee joint at maximum flexion), in which we find that the center team was superior to others as a result of their lowering muscles being stronger than others as a result of good, standardized training, and from this we conclude that the third year received exercises that strengthen the thigh muscles by training on strength characterized by speed.

-Presentation and discussion of the flight phase results:

Table No. (03): Shows the results of the flight phase.

In the calculated	In the table	The second group		First group		Samples Analytical Skill	Types of motor analysis (qualitative or quantitative)
		A	S	A	S		
1,09	3.30	0,075	0,26	0,97	0,24	Stage time	Quantitative analysis
2,73		22,16	48,75	26,00	59,16	Not looking at the target	Qualitative analysis
0,251		20,44	117,62	12,75	119,82	head-shoulder angle	Quantitative analysis
1,585		9,37	76,66	16,54	66	Insufficient posterior rotation of the throwing arm shoulder	Qualitative analysis

0,482	16,57	95,08	21,60	102,56	Shoulder angle to trunk	Quantitative analysis
4,400	13,78	69,16	20,68	58,56	Not taking into account that the angle of the forearm and upper arm is obtuse while performing the shot	Qualitative analysis
3,580	20,79	125,86	26,12	113,40	forearm-humerus angle	Quantitative analysis
2,136	12,93	74,16	11,54	63,33	The throwing arm's shoulder does not rotate slightly backward (weak aiming power)	Qualitative analysis
0,497	19,44	94,33	8,15	95,33	Shoulder angle with trunk from behind	Quantitative analysis
0,841	11,17	37,91	18,72	43,75	Exaggerating the extension of the free arm in front of the body and trunk	Qualitative analysis
0,914	8,25	83,46	15,06	147,48	Free arm angle with the trunk from the front	Quantitative analysis

From Table No. (3): We find that all values are not statistically significant at the significance level of 0.05 except for the values obtained from (not taking into account that the angle of the forearm and upper arm is obtuse during the performance of the shot from the qualitative analysis, the angle of the forearm with the upper arm). We find that these values are statistically significant at the significance level of 0.05. This indicates the lack of homogeneity between the research groups in the results of the angle of the forearm with the upper arm in the flight phase, which confirms the third suggestion (not taking into account that the angle of the forearm and upper arm is obtuse during the performance of the shot (non-whispering throwing arm movement)) for the flight phase of the High-Ward model and the validity of our result for the third suggestion for the third stage, which is a quantitative kinematic variable. As Ali Al-Nusaif and Qasim Hassan Hussein say in their book: Principles of Sports Training: “The faster the preparation, the more likely the shot is” (Abdul Ali, 1988, p. 40). This shows that the ascent must be faster with the speed of the ball’s launch, as a result of increasing the radius of the throwing circle, which is consistent with the study of Hajim Shani. The variables (elbow joint angle at the time of scoring, height of the ball's launch point, and ball launch velocity) show that the ball's launch velocity is due to the increased radius, which helped the center team outperform the others. It also helped the first group outperform the others in the accuracy test.

-Presentation and discussion of the landing phase results:

Table No. (04): Shows the results of the landing phase.

In the calculated	In the table	The second group		First group		Samples Analytical Skill	Types of motor analysis (qualitative or quantitative)
		A	S	A	S		
4,14	3.30	0,054	0,24	0,92	0,25	Stage time	Quantitative analysis
0,083		15,04	68,58	15,13	67,0	Do not land softly and flexibly by touching the ground with the foot	Qualitative analysis

					opposite the throwing arm.	
1,234	14,61	17,50	16,57	16,91	Man's angle to the ground	Quantitative analysis

From Table No. (04): We find that all values are not statistically significant at the significance level of 0.05 except for the values obtained from the stage time. This indicates the lack of homogeneity between the research groups in the stage time, as we find that the first group took the longest time, and this is because the flight time was greater, which makes the landing time longer, and as a result of the first group controlling their entire body, even the legs, even in landing. - Conclusion: After analyzing, presenting, and discussing the results, the student researcher reached the following

conclusions:

Most of the variables were not statistically significant except for three variables (time of the take-off phase, the angle of the forearm with the humerus during the take-off phase, and the fourth suggestion (the angle of the forearm with the humerus not being obtuse), and a quantitative variable (the angle of the forearm with the humerus during the take-off phase) and its corresponding qualitative variable in flight (not taking into account that the angle of the forearm with the humerus is obtuse), which made the first group outperform the other group in measuring accuracy. It also became clear to us that the results of the qualitative analysis of the High-Ward model matched the results of the quantitative analysis except for only one variable in the take-off phase (not taking into account that the angle of the forearm with the humerus is obtuse), and it is accepted in the quantitative (the angle of the forearm with the humerus). From this, we conclude that the High-Ward model is good and effective for qualitative analysis and that the level of the first group is better than the other group, despite the fact that the kinematic variables were not achieved. Therefore, the researcher suggests that more attention be paid to these variables by proposing training programs that develop These variables. Increasing the radius of the throwing arm during a throw increases the speed of the ball's launch and indicates greater ball control, which is consistent with similar studies and theoretical studies.

- Discussion of the results using hypotheses:

- The first hypothesis:

In which we assume the existence of statistically significant differences in the values of some kinematic variables for the performance of the shooting skill by rising in handball among the center's student team. To analyze this skill, we used analysis to compare performance with theoretical curves. The difficulty of this type of analysis lies in deducing the theoretical curves for the characteristics to be compared with the players' performance and the extent to which any development in the performance style can be proposed, with the aim of attempting to bring the values of the studied variables to the maximum limits indicated by the theoretical curves (Talha, 2005, p. 405). From the results mentioned previously in the tables, we find that this hypothesis has been verified through the "time frames" and the statistically significant results. We notice in the approach phase that the best time was for the first group, which is the average of the times, and that is because the second group was rushing in performing this phase and the first group was slow in performing this phase. As for the second phase (ascent), we notice that the best time was in favor of the first group and then the

second group, because the best time in this phase is considered the least, which helps in good ascent and hence good flight, meaning more time remains, which gives a good opportunity for shooting, and as Abdul Ali Al-Nusaif and Qasim Hassan Hussein said in their book: Principles of Sports Training, "The faster the preparation, the more likely the shooting is" (Abdul Ali, 1988, p. 40). This is also what agrees with Hajim Shani's study in interpreting the variable angle of the right knee joint at maximum flexion, in which he attributes that the scoring was good as a result of the training received by the coach who focused on the strength characterized by speed, especially the thigh muscles (Shani, 2008). We see that the third year had a large increase, and that is due to the strength characterized by speed and the superiority of the lowering muscles over gravity. From the other levels (the second and first, as Ahmed Khater and Ali Al-Baik confirm, "the strength distinguished by speed has a clear importance in achieving results in terms of physical activity, especially that type of motor performance with a variable nature (Ahmed, 1996, p. 176) as a result of the training taught by the institute's professors, followed by the flying stage, which is served by the other previous stages. In order for the shooting to be good, the flight must have sufficient time for the shooting. We see from the "Kangram" of the three times that the best time was in favor of the first group, , then the second, to increase the speed of the ball's launch. Saleh Abdel Aziz says in his book (Education and Teaching Methods) "Speed when throwing, the throwing hand must be behind the ball, the ball must be accompanied to the farthest place the throwing hand can accompany it, the throwing must be strong and accurate" (Saleh, 1985, p. 46) and good flight makes the goal in good view, which is consistent with Hajim Shani's study on variables (knee joint angle at the moment of scoring, height of the ball's launch point, and ball launch speed), which showed that the ball's launch speed is caused by an increase in the radius, which helped the center's student team to excel over others, and helped the first group to excel over others in the accuracy measurement test and also indicates ball control and a longer flight time gives (a good shooting angle because the shooting angle helps with greater concentration, according to Abdul Ali Al-Nusaif and Qasim Hassan Hussein in his book: Principles of Sports Training in the Theoretical Side "Shooting angle: The more the shooting is from the area facing the goal, the higher the success rate of the shooting. Distance: The shorter the distance, the more accurate the shooting. Direction: The more the ball is directed to the corners or critical areas for the goalkeeper, the more difficult it is for him to block it, and the wrist plays an important role in blocking it. This analysis was concluded from the principles of motor learning in the theoretical side" (Abdul Ali, 1988, p. 40) In addition, the group's level was better than others, due to the fact that they received excellent lessons from university professors over three years. This means they received thorough training in the stages of motor learning. Regarding the stages of motor learning, Al-Bahi Al-Sayyid says, "Learning any new skill and reaching its highest level must pass through three interconnected and complementary stages (paths). These are: - The stage of rough coordination - The stage of fine coordination - The stage of mastering the motor skill (automatic). In order for the learner to be able to perform the skill aspects, he must reach the third stage (the stage of automatic performance). This depends on his success and passing of the first and second stages during the training process in the previous periods. With the stage of learning rough coordination, the first stage of the skill, the initial motor concept is adjusted, while the components of other capabilities related to the skill continue to be developed" (Al-Sayyid, no year, p. 41). Regarding the landing time, we note that the landing time was close between the levels.

- The second hypothesis:

In which we assume an improvement in the level of the university center's student handball team, and the results have proven the validity of this hypothesis, as We found significant differences between the aforementioned test in the first hypothesis, which achieved the highest arithmetic mean for the accuracy measurement test and the qualitative and quantitative analyses.

Recommendations: The researcher recommends the following:

1. Emphasize the technique of high-flying shooting due to its effectiveness.
2. Follow scientific methods and means when developing educational and training programs, such that high-flying shooting is a major focus.
3. Monitor players' performance through physical, skill, and kinematic tests, etc., to determine the extent of their development and suggest solutions if their performance is weak, using models such as the High and Red.
4. Support biomechanical research, given its scientific purpose.
5. Continue preparing students for these types of research.

Sources and References:

- Al-Bahi Al-Sayed (no year). Psychological Foundations. Cairo: Dar Al-Fikr.
 - Al-Khashab and Maher Al-Bayani Zuhair (1988). Handball. Dar Al-Kitab Press, Mosul.
 - Hussam Al-Din Talha (2005). Biomechanics and the Foundations of Theory and Application. Cairo: Dar Al-Fikr Al-Arabi.
 - Hassan Abu Obeida (1993). Analysis of the Kinematic Characteristics of Three Selected Methods for Soccer Hitting. Baghdad: University of Iraq.
 - Hassan Al-Naseef Qasim Hassan Abdul-Ali (1988). Principles of Sports Training. Higher Education Press: Baghdad.
 - Khater and Ali Al-Baik Ahmed (1996). Measurement in the Sports Field. Cairo: Dar Al-Kitab Publishing House, 4th ed.
 - Shalash Khuraibat and Najah Mahdi Risan (1992). Kinematic Analysis. University of Basra: Dar Al-Hikma.
 - Adel Abdul-Basir Ali (no date). Qualitative Analysis of Human Body Movement. 1st ed. Cairo: Egyptian Library.
 - Abdul-Aziz Abdul-Aziz Al-Hamid Saleh (1985). Education and Teaching Methods. Publishing House: Baghdad.
 - Farouk Abdul-Samad Tariq (2005). The Theory of Basic Characteristics: A Perspective for the Analysis of Sports Skills, Part One. Dar Al-Fikr: Cairo.
 - Najah Mahdi Shalash (1988). Principles of Biomechanics in the Analysis of Sports Movements. Cairo: Dar Al-Kitab for Printing and Publishing.
 - Wajih Mahjoub Jassim. (1990). Physical and physiological kinematic analysis of sports movements. Baghdad: University of Baghdad.
- Internet:
- Hajem Shani. (July 14, 2008). Google. Retrieved May 8, 2010, from <http://vb.g111g.com/f358/22>
 - Aref Al-Karmadi. (March 31, 2008). Google. Retrieved January 30, 2010, from <http://www.buzia.com/p=48/>Retrieved at 0:21:05