

Kinetic Analysis of Some Mechanical Variables for a World Champion Long Jump for a Women

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Abstract: Of the most important duties of Athletic Training Specialist to achieve a complete athlete requires knowledge of a lot of factors, mechanical and influencing it is due not achieving to the neglect of some of the factors and this is the achievement of the most difficult issues facing the sports training and those in his field. Either for the women entered the contest the long jump starting cycle year (1928) and follower of the achievements of international sports see if the sport in the development of a permanent and continuous it has won the effectiveness of the long jump attention to these experiences that helped us find the most important factors that must be taken care of and focus on to improve the level of achievement better. motor analysis is used in determining the level of performance movements and mathematical skills when players accurately, and in which you can extract the values of variables kinematical and compared with variables kinematical model to know the strengths and weaknesses of the performance of the players and contribute to modify this performance for the better. Hence the problem of searching through my work in academic research have noted the low level of achievement to the players the long jump even at the global level because of absence of the link between these variables under study during the performance. Research objectives: Identify some of the variables kinematical between world champions and their relationship to achievement jump term (2012). Hypotheses: There are significant differences in some of the variables under study of the effectiveness of the long jump between the champions of the world and their relationship to achievement.

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1. Introduction:

Of the most important duties of Athletic Training Specialist To achieve a complete athlete requires knowledge of a lot of factors, mechanical and influencing it is due not achieving to the neglect of some of the factors and this is the achievement of the most difficult issues facing the sports training and those in his field. either for the women entered the contest the long jump starting cycle year (1928) and follower of the achievements of international sports see if the sport in the development of a permanent and continuous it has won the effectiveness of the long jump attention to these experiences that helped us find the most important factors that must be taken care of and focus on to improve the level of achievement better. motor analysis is used in determining the level of performance movements and mathematical skills when players accurately, and in which you can extract the values of variables kinematical and compared with variables kinematical model to know the strengths and weaknesses of the performance of the players and contribute to modify this performance for the better. Hence the problem of searching through my work in academic research have noted the low level of achievement to the players the long jump even at the global level because of absence of

the link between these variables under study during the performance.

1.2: Research objectives:

Identify some of the variables kinematical between world champions and their relationship to achievement jump term (2012).

1.3: Hypotheses:

There are significant differences in some of the variables under study of the effectiveness of the long jump between the champions of the world and their relationship to achievement.

1.4: Find the areas of:

- 1.The human sphere (8) of the world and prove.
- 2.Temporal area(2012).
- 3.Spatial domain: Daegu Stadium in Korea.

2. Theoretical studies:

2.1: The technical phases of the long jump:

The Sports Athletics Bride World Games which include various items of motor skills and private components of fitness such as speeding, strength and endurance, flexibility, etc., and characterized by assessing the achievement of the human where the translated levels to the times in the activities of the field, and to the distances and elevations in the

activities of the arena, as well as it gives the index honest about the possibility of the individual and the ability to develop these capabilities to achieve the objectives and requirements of efficiency, according to the various technical stages. The oath to Mohammed Othman (8-333):

* Improve the approach and landing, aviation, approach and this distance can be divided into two parts:

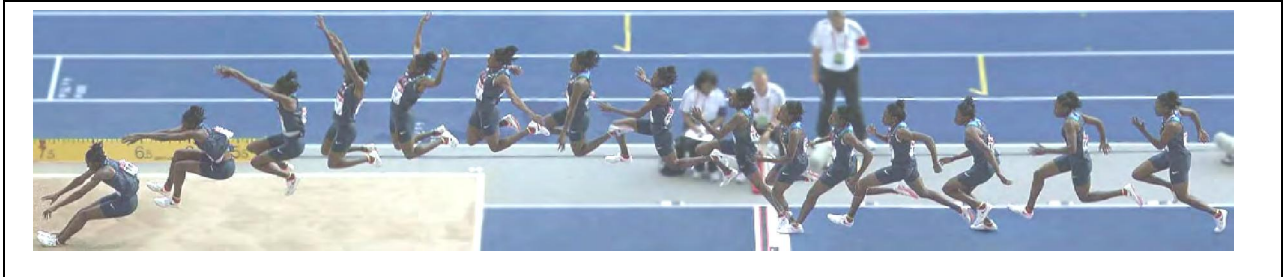
A - The first part of the increasing speed only. B - The second part to prepare for the upgrade of the bounce and movement according to the requirements to obtain a starting speed and angle appropriate (the last three steps).

2 – Upgrade (take-off)

3 - Flying in the air, a kinetic path for the body

4 - To end the downward jump.

1: close:



Figure(1): Analysis of the performance skills of the world champion (Reese), which proved to 7.15cm in USA Championship2012

Biomechanics

The first two phases to reach the maximum speed is called acceleration phase is characterized by the steps in regular rhythm, either the second phase is the last of the four steps of the approach. In some sources referred to by three times with the last steps of the approach is called the stage of preparation for the upgrade. Where the change in the rhythm of these steps in order to help the body to take the best position when upgrading to exploit the maximum horizontal speed when converted to vertical velocity "is the stage of upgrading is important because it is determined depending on the values of variables kinematical that control the path the center of gravity The body during flight, the flight angle, flight speed and high center of gravity of the moment of departure, in addition to air resistance.

2:take-off:

The main objective of take-off is to get the force payment for the payment of the body forward and up and that starts the beginning of this stage of the collision made upgrading panel and end panel leaving them along the joints of the foot, knee, and pelvis.

The purpose of this stage and suggest experiments to the angle of upgrading should be up to

Begins to approach the status of higher starting. This kind of beginning the process of selecting the most suitable believes the steps of the approach. These different factors should be considered with respective significant access to a panel upgrade to improve the foot truth and accuracy, which obliges the full instep to be fully above board. • Adjust the number of steps in the distance jogging track.

Adjust the length of each step in proportion to the running speed increased gradually to the most important factors affecting the distance of the long jump horizontal is the speed of approach and the process of upgrading has been touched analysis of the components of motor performance in the stage to get closer to simplify the study, where divided by (Hay, 1978) (10-98) from the viewpoint of

20-24degrees in order to secure access to the corner of the appropriate height in flight¹. That the key to success in the long jump is the amount of interdependence between the three steps the recent speed of approach with the moment foot drop in preparation for the stage of upgrading so that it is the time of contact foot to landless than what can be considered upgrading the most important and most difficult stage of technical long jump². Not separated from the stage of upgrading stage approach in any way, they have an extended period. despite the brief time it takes jump at this stage but it passes through three stages connected, so in theory, as follows:

Start-up phase set foot on a board upgrade take-off (invoked)

- the stage of improving the survival of the foot on the board upgrade. (Vertical position)
- payment stage of upgrading the strong foot panel upgrade. (Payment)

During the performance of the last steps should be lifted knee man raise less and put the foot on a board upgrade from the heel and you are rolling to comb quickly and be a man raise when placed upright almost in the knee joint so as to improve and be ready to perform the work requires a great effort.

During the take-off to be a focal Enhancing the state for a time period ranging between (0.11-0.13) and a second bore pressure exceeds the weight of the player to Profile (5-6) times, and the angle of promoting the development of man (165-75) degree.

3: Flight:

During the phase off light must be maintained on the vertical position of the body, and in this stage, the emergence of conditions more favorable for the transfer of the two men for the imam to perform the landing phase and can perform different movement sat the stage of flight, after the upgrade directly from the panel upgrade and to take the situation is necessary for landing. The shape of these movements is the one who determines the way jump (attachment, walk, squat(step) and each of these methods positives and negatives. It is noteworthy that Mohammed Othman's way of walking in the air has proved more effective than other methods.

4: Down:

And begin the process of landing the basis of the land campaign against the feet behind the point of the curved phantom flight center of gravity of the body and when you combine the two men to the farthest distance when landing. Should not rush the process of laying down the two men in the knee joint, because such a move premature difficult process of maintaining the horizontal position on the higher of the two men must stretch out the leg sin the knee

joint before landing directly in the landing two men must bend the trunk and the tendency²

3.1: Research Methodology:

The researcher used the descriptive method to fit the research problem.

3.2: Research Sample:

The research sample was selected in the manner they are intentional (7) players from the Women's World Champion who earned the first rank in the race for the broad jump championship in Athletics Berlin 2011.

3.3: Methods of Collecting Data and Hardware and Tools Used:

3.3.1: The methods of collecting data:

- Sources and Arabic and foreign references.
- Observations and analysis.
- Staff Assistant.
- Journal of the International Federation of Athletics.
- www.iaaf.com

3.5: Experience Index:

3.6: Statistical tools:

- The arithmetic mean.
- Standard deviation.
- Test the link to determine the correlation and moral link³

4: Results and Discussion

Table (1): Correlation between achievement and the speed of horizontal takeoff

Variables	The mean	Standard deviation	Correlation	Tabular value	Moral Correlation	
Real distance	6.75	±0.26	0.65	0.46	1.95	1.7
Speed horizontal takeoff	7.82	±0.32				

Through Table (1) the correlation (0.65) is greater than the tabular value (0.46) as the link that the moral value of (1.95) greater than the tabular value (1.7), it means that the distance between the center line of the body weight of gravity would be reduced and this leads to reduce the voltage on the working muscles and therefore the value of momentum, allowing the best opportunity to have the maximum .payment and therefore what can be ideal for performance and smoothly⁴ According to researchers The speed of movement of center of gravity in an instant upgrade and high center of gravity for the takeoff and a space upgrade, , they possess high strength and lower limbs which make them exceptional, especially in dealing with the plate and improve traffic flow in the link between the move and improve and not to a significant loss in

horizontal speed. We find that the transition from speed to jump, there has been a decrease in the horizontal speed especially in the step before the final result of the development to stop and as a result fulcrum foot to land and prepare for the leap of fear of mis-upgrade (energy is potential here transformed into kinetic energy into motion), while changing the direction of vertical velocity from the direction bottom to top direction. These changes occurred because of the ground reaction force ground reaction force). As for the values of speed, we find that the horizontal velocity and gained from the approach keeps the top, and vertical velocity was least affected by the ability of muscles of lower limbs in the issuance of the power to a time certain to overcome the attraction ground and other forces which reflect the first summit on or basing the land of the approach

and then landing bend the joints during shortly to achieve the second summit and the function on the

willingness to pay.

Table (2): Correlation between achievement and the speed of vertical takeoff

Variables	The mean	Standard deviation	Correlation	Tabular value	Moral Correlation	
Real distance	6.75	±0.26	0.50	0.46	2.16	1.7
Speed vertical takeoff	3.20	±0.20				

Through the Table(2) the correlation (0.50) is greater than the tabular value (0.46) as the link that the moral value of (2.16) greater than the tabular value(1.7), it means that when performance of the movement of advancement or upgrade, which consists of a stage touching the ground and left van angles to approach hand pay importance in judging the validity of performance or mistake and if the angle of approach is the angle between the line connecting the center of gravity of the body and the foot the moment of touching the ground with the horizontal line passing through the foot of the need of the land⁷. It means that the distance between the center of gravity of the bodyline of gravity will be

reduced and consequently the determination of weight as a crippling be few and thus lead to a reduction of effort on the muscles working and thus the value of momentum is better than providing the opportunity to be a payment maximum of what can, however, there are ideal for performance and smoothly. We note that the speed of the center of gravity in an instant upgrade and high center of gravity of the take off distance and enhance and improve the speed and distance were significant because of the legal level, the world's first in many of them or batter qualities of physical and technical performanceright⁵

Table (3): Correlation between achievement and take-off angle

Variables	The mean	Standard deviation	Correlation	Tabular value	Moral Correlation	Tabular value
Real distance	6.75	±0.26	0.55	0.46	2.39	1.7
Take-off angle	22.15	±2.28				

In Table (3), we find that the value of the link (0.55), which was greater than the tabular value of (0.46) as well as a moral good correlation of the values that have emerged (2.39) and was greater than the tabular values (1.7) for the moral link and this indicates that the sample taken the situation mechanic right in the performance of the movement of advancement or upgrade, which consists of a stage touching the ground and left Van angles upgrade and pay importance in judging the validity of performance or wrong When increasing angle of approach is the angle between the line connecting the center of gravity of the body and the foot touching the ground for a moment with the horizontal line passing from the foot of the critical land⁶. It means that the distance between the center of gravity of the body line of gravity will be reduced and consequently the determination of weight as a crippling be few and thus lead to a reduction of effort on the muscles working and then the value of momentum is better than providing the opportunity to be a payment

maximum of what can be, and thus have a perfect performance and smoothly.

In Table(4), we find that the value of the link the top of the class spread sheet as a moral link to a good through the values that appeared larger than the values indexed(1.7) form oral engagement and this indicates that the sample taken the situation mechanic correct the condition of the trunk during the movement promoting or up grading also increase the angle of inclination of the trunk or lower take off have a significant impact on making the correct anatomical position, while the correlation of the inclination angle of the trunk to take the situation emphasizes the fact that the mechanical proper sample under analysis are the world champions for women. Also, each angle body (trunk and knee angle and center of gravity of the body trunk and the tendency of the moment of departure and landing) was the correlation with the degree of moral and this shows the situation to take the correct mechanical and commensurate with the length of their body parts.

Table (4): Correlation between achievement and trunk of the take-off angle

Variables	The mean	Standard deviation	Correlation	Tabular value	Moral Correlation	Tabular value
Real distance	6.75	±0.26	0.47	0.46	2.11	1.7
Trunk of the takeoff	97.6	±2.24				

Table (5): Correlation between achievement and the landing angle of the trunk

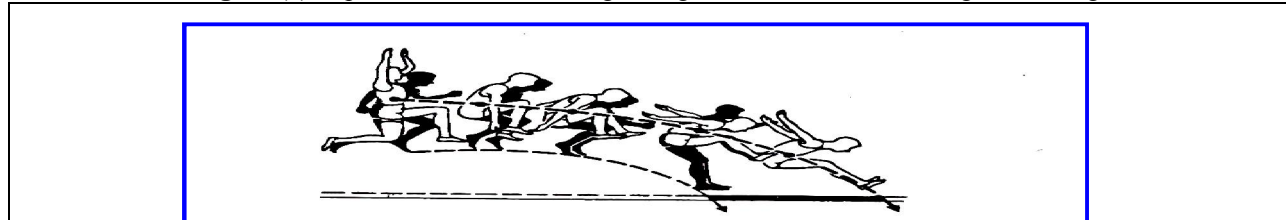
Variables	The mean	Standard deviation	Correlation	Tabular value	Moral Correlation	Tabular value
Real distance	6.75	±0.26	0.42	0.46	1.67	1.7
Angle of trunk	89.8	±7.19				

In Table(5) we find that the correlation is less than any random tabular values of (0.46) and through the link and moral value of (1.67), which appeared less than the tabular values (1.7) for moral engagement and this shows that sample did not take the most appropriate mechanical situation.

When performing downward movement, which consists of a stage touching the ground at the

completion of the performance effectiveness Van angles landing importance in obtaining a distance of landing a good through zoom or reduce the angle of the trunk closer trunk with the man's outstretched with the movement of the upper back and forward to get the process of equilibrium as in Figure 1.

Figure (1): represent the white landing the right and the dark color is a good landing



And not to fall early (touching the ground early) The process of landing need a consensus in the movement of the upper and lower to get the angle perfect for performance and thus touched the ground at the farthest point towards the front for maximum distance and this means that the landing early means getting a space flight is less well to accomplish less.

Rhythm dynamic of the two-step two years in order to keep as much as possible on the speed necessary to perform the advancement of the right without reducing the speed or delay them, and that the loss of speed a little in the last step contributes effectively to the performance of a good stride length, because after the upgrade I happen landing speed of the horizontal stages of the move and jump, then recommend to the coaches to their players not to focus on a given phase of the race at the expense of the other stages of its impact is clear the total distance for the race and there is no rates fixed for these key stages of the triple jump. "Although the factors of speed and power have a key role in determining the value of the capacity that is different from effectiveness to the other as the process of upgrading is against considerable resistance depends

on the strength of more than technical performance, which against resistance is small, which relies heavily on speed larger⁸

Conclusions and Recommendations:

5-1 - Conclusions:

- The research sample was a good mechanic to take the correct the situation because they represent the elite in this event where the player has achieved first place winner distance of the fact of (6.64) meters, a figure well to this point.
- The missing link in the horizontal velocity jump stage was the rate of (8.34) and their relationship to achievement, once a high correlation to the main Ohmtha get done well.
- We find that the correlation random angle of the trunk and distance delivery because of failure to take the situation mechanic right in the performance of downward movement, which consists of a stage touching the ground at the completion of the performance effectiveness Van angles landing importance in obtaining a distance of landing a good through zoom or reduce the angle of the trunk occurring with along the lower limbs.

- When performing downward movement, which consists of a stage touching the ground at the completion of the performance effectiveness Van angles landing importance in obtaining a distance of landing a good through zoom or reduce the angle of the trunk and a relationship high between the speed upgrade and a space jump, considering that the speed factor is the most important factor in achieving best upgrade for a distance of projectiles and by a significant contribution.
- The angle formed upgrade (22.15) and the fact that the degree of horizontal velocity are very important in the process of trying to jump the players to make more effort and better angle and a good way.

5-2 - Recommendations: - Recommends the researcher to:

- Conducting studies using the platform biomechanics forces to study the factors kinematical and their contribution to the achievement. The uses of sensors determine the muscle forces that contribute significantly to the muscles of the legs in the power that contribute to the achievement.
- Conducting studies to determine the impact of horizontal displacement of the trunk on the achievement of the players and their relationship to the study may inertia. A comparison between the level of our players shops and compare the global level to identify the strengths and weaknesses to improve the performance of local players.
- Comparative studies between common variants kinematical long jump with the variables of the triple jump.

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