Course Name: Bachelor of Physical Education Year - IInd (Part-3) Paper Name - Skill and Prowess Topic Name - Skill and Prowess Topic No. – Part – III (B) II Paper No. - B Lecture No. – 21

#### **Lecture Title**

#### High Jump - 2

Script

#### **The Acceleration Phase**

The jumping leg reacts to the forces exerting power on the supports by an increasing tension of the muscle, especially of the free-leg extensors. This tension produces the levering effect which we have already mentioned, causing a bending of the body's flight path upwards. In this phase the strongest locking of the knee is not yet concluded. The knee joint opens, i.e. the jumping leg straightens only when the swinging masses (swinging leg and arms) have passed their maximum acceleration, in fact when pressure on the support leg is released. At this point, the angle at the knee joint is of about 135 to 140 degrees.

The line of force must not be interrupted by bending at the hip joint. The pelvis must continue to press forward and upward. The upper part of the body must be brought out of its lean through a bend of the upper part of the spine, resulting in the typical crouched position of the high jumper before the actual take-off (figure 2)

During this phase, the body's CG moves in a vertical line and favorable conditions are created for the subsequent bar clearance by introducing angular momenta which vary according to the form of bar clearance used.

It is difficult for the jumper to generate these angular momenta, as his body must, for this purpose, assume positions which work against the logical application of force. Good jumpers therefore attempt to delay this moment as long as possible, thus keeping impulse losses small. In contract with this, bad jumpers try to prepare for the rotation during the approach and in the transition to the take-off by stepping out of the line of the run-up. In doing this the body weight is shifted too much and too early over the jumping leg, leads to the loss of a great part of the force impulses during lift. In the final take-off phase the body must be completely extended from the toes upwars, reaching an angle of 90 degrees to the horizontal. **Figure 3** 



In the straddle (figure 3) the heel, after coming off the ground, is pressed inwards so that the foot turns out. This movement is introduced by the swinging leg but involves the whole body. The leg swings up-ward and forward in the running direction and draws, in the final phase of the take-off, the hip of the free side of the body into the movement. This brings the jumper, at the end of the jump and at the beginning of the bar clearance phase, into a position which will allow the various parts of his body to drift across the bar in a flattened arc (figure 4). The arms also swing upwards in the straddle in an analogous movement to that of the legs, in which the arm and shoulders of the free-leg side swing higher than those of the other side.

Figure 4



Beginners, but some top-class jumpers as well, frequently make the mistake of introducing the rotation by angling the swinging leg towards the bar. This leads to an excessive "laying" and to considerable loss of height.

We now briefly explain the action of the swinging leg. The movements of the swinging leg have great importance for the performance and the success of the takeoff. This action has the following aims and characteristics:

- 1. The swinging leg action creates a movement, which is transmitted to the body as soon as this action is braced. The faster the movement of the swinging leg. The more energy can be drawn from it at the end for the take-off.
- 2. Because of the considerable acceleration of the swinging leg during absorption of the impact, the pressure on the take-off leg in increased and engenders reaction forces in the calf muscles. This is why the velocity of the swinging leg has such a great influence on the speed of the speed of take-off.

- 3. The height of the swinging leg at the end of the push-off is one of the determining factors for the take-off height of the body's CG.
- 4. The angular momentum produced by the strong one-sided pull of the swinging leg in a forward-upward direction for the western roll and straddle.

Actually, two techniques can be applied for the swinging leg action: one in which the leg is bent at the knee joint and one in which it is straight. On the whole(,) the straight leg technique is more advantageous for the parallel, so much so that the majority of the world–best jumpers use it short analysis of the extended swinging leg action:

The action of the swinging leg is introduced by the hip, which moves forward and upward before and during touchdown of the take-off leg. The leg is still strongly bent at the knee joint and the point of the foot is cocked to prevent hitting the ground. The jumper must now **endeavor** to get his swinging leg past the take-off leg as rapidly as possible. When this has occurred, the jumper will thrust the lower part of his leg vigorously forward and upward with a whip-like movement, so that his swinging leg is now completely extended in a horizontal position(**figure 5**).



This movement is of the greatest importance; because the kinetic energy produced by the lower part of the leg is transmitted to the whole part of the leg the moment of extension, so that it experiences an additional acceleration. In order to maintain this extended position all muscles of the swinging leg must be tensed so as to avoid the lower leg lagging behind the complete movement. The idea that after this movement the leg should bend again is erroneous can often be seen in jumpers, but is only a sign of lack of suppleness.

The swinging movement of the arms and of the free leg **is** halted just before the end of the take-off. In the straddle the hip side must be drawn into the forward-upward movement of the swinging leg to produce the required rotation impulses.

#### **Bar Clearance and Landing**

The highlights of the jump are the techniques used in crossing the bar; the different jumping styles are named accordingly.

Basically five jumping techniques are known: straddle, western roll eastern cut-off with and without trunk layout, scissors and fasbury flop

All these forms have naturally variations which will not be discussed here.

The movements during bar clearance have as their purpose:

1. To bring the parts of the body into the most favorable relation to one another so as prevent the bar being knocked down and to enable the jumper to utilize, as best he can, the rotating movement through acceleration or deceleration, in order to cross the bar;

2. To both favorable conditions for a safe landing.

In both roll and straddle, at the end of the take-off, the air-born body is brought from an almost vertical position to a near horizontal one for clearing the bar. In fact the only difference is that the rotation is more marked in one style than in the other, so that shifting of the various parts of the body naturally varies.

These differences become evident only during bar clearance and in preparation for the landing; in the first phase, i.e. during the approach with the bar, differences between the roll and straddle style are only slight.

In preparation for the bar clearance(,) the straddle jumper, particularly through the unilateral pull of the swinging leg, begins to rotate with front of the body to the bar first, together with the arm of the same side, and is initially almost at right angle to the trunk, is now stretched along the bar. At the same time(,) the jumping leg is drawn up close to the hollow of the knee of the swinging leg and pressed outwards. As a result, the parts of the body are grouped around the longitudinal axis of the body and the jumper experience an acceleration of angular momentum about this axis. The jumper now turns his face and chest completely to the bar and is lying almost parallel to it. The head should be pressed to the chest the arms, which at first were in front of the body, are now on the side and close to the trunk; frequently the inside arm is curled up the chest.

In this phase the turning outwards of the jumping leg is started, one of the most important movements in crossing in the bar. The thigh is turned outward in a pronounced manner from the hip joint, at which point the knee and tip of the foot (also turned outwards!) assume the leading role in the movement. It is not necessary to straighten the knee simultaneously; it is far outwards is limited by a lack of mobility at the hip joint, it is continued by an additional torque about the spine.

The jumper is now moving away from the bar and preparing for landing. Since the rotation of his body about the long axis would force him to land on his back, he must now strive to delay this rotation. This is achieved by allowing the trunk, arms and swinging leg to move downwards, away from the longitudinal axis, by extending the jumping leg upwards and backwards. This makes for a soft landing. The free leg and arm usually touch the ground first, thus reducing the impact. The body then rolls over the shoulder or the hips to the back.

This technique can be further improved by diving over the bar figure 6.



This should not, however, **be confused** with the "dive straddle", a technique which shall be discussed separately.

From the position of the body on top of the bar described above, the trunk and the swinging leg fold together, so to speak, with the pelvis as a turning point (compare figure 2). Through this diving movement, the pelvis, and with it the joint of the jumping leg, is shifted upward, permitting the jumper better to turn this leg away from the bar. This, of course, requires excellent judgment, which can only be acquired after

long experience. A jumper should therefore attempt this technique only when he masters the parallel straddle perfectly. Often these two forms more or less merge into each other.

The dive straddle differs from the parallel straddle in that the body makes a greater angle (sloping more) with the bar. In this style, it is not a rolling movement but rather a tipping movement that predominates. It requires considerable angular momentum and a corresponding amount of strength to produce it, so that this technique is not as efficient as might be expected, considering the different phases of bar clearance separately. If we mention it here briefly, it is because it has a certain amount of strength to produce it, so that this technique is not as efficient as might be expected, considering the difference phase of bar clearance separately. If we mention it here briefly, it is because it has a certain amount of importance in college sports and in the training of beginners.

#### **Technical Training for the Straddle Jump**

The continuing extensive use of the straddle and the experiences and knowledge associated with it are sufficient ground to refer mainly to the jumping technique in what follows, while the other techniques will be treated only in the technical foundation training. But we should first make clear when to begin with the training of the straddle style. Generally one **assume** that an important prerequisite is a fair amount of explosive force, jumping ability and jumping experience. This means that the push-off in **experience** an upward direction must be thoroughly mastered. If these demands are not satisfied, various mistakes may creep in during training of the straddle jump over low heights which will hinder further development. As a rule, therefore, one should not start with special training of the straddle before the age of 13 or 14, whereas learning the crude or simplified form can be started by boys and by girls, at the age of 9 or 10 years, mainly with the object of building up versatility and agility.

The straddle jump should be learned in two stages, with different objectives. The first stages **of** the training of beginners and for practice on a mass basis; it includes the foundation training (also some special training) and should lead the jumper to the mastery of a satisfactory straddle jump technique.

## **Special Preparatory Exercises**

Before starting to train a particular sequence of movements, a more general preparation for the high jump is required. Because of its special requirements, the following of its special requirements, the following points must be taken into account:

- a) To achieve a step and high flight curve, the action of the swinging masses (swinging leg and arms) must be smoothly linked with the take-off movements.
- b) In modern high jumping (straddle style) the rotation of the body plays an important role. This requires a special technique for producing angular momentum at the end of the take-off.
- c) In modern high jumping (straddle style) the rotation of the body plays an important role. This requires a special technique for producing angular momentum at the end of the take-off.

# In the light of these points three basic forms emerge for the special preparation of the high jump:

1. Jumps over various obstacles with a take-off from one leg, putting special emphasis on a relatively long take-off stride and adequate backward lean in the jumping position.

- 2. Jumps with a longer flight phase than usual, requiring special agility, in which considerable demands are placed on the jumper's sense of orientation by turns and obstacles.
- 3. Gymnastic exercises requiring jumping power, jumping agility and mobility (handsprings, somersaults, stretching exercises) but also a "fell"for the cushioning function of the roll-off movements (rolls in various forms). In the preparation for the fosbury flop take-off from a curved run-up (oblique position), followed by rotation around the longitudinal axis, and should be practiced in addition to exercises of the foundation programmers.



#### **Points for Fundamental Training**

- The high jump is divided up into the following phases: approach, take-off, bar clearance and landing.
- The approach comprises a straight and a curved section.
- 3-6 strides run in a straight line.
- Run the straight section of approach with upright trunk.
- Increase approach speed with large, force strides.
- Lean towards the inside of the curve during curved part approach. Shoulder on inside of curve is lower than shoulder on outside of curve.
- Continue to increase approach speed with forceful strides. With particular emphasis on driving off from last but one approach stride into last approach stride.
- Final stride is somewhat shorter. Take-off foot should land quickly and with accelerated action. Toes points to landing position; foot should not be parallel to front of landing area.
- Raise thigh of free leg quickly to horizontal position and maintain position; swing arms up to head height and maintain position. Extend ankle, knee and hip joints.
- After take-off continue to keep free leg in horizontal position. Take-off leg continues to be extended
- Move left arm as leading arm first over the bar.
- Lift hips while clearing the bar.
- When hips have cleared the bar, draw head towards chest and extend legs.
- Land on whole back supported by arms.
- Keep knees apart whilst landing.

## **Duties of Officials**

- A minimum of 4 Judges are required to judge effectively. The function and position of each Judge is:
- Judge 1 (Chief): Keeps record of trials, warning horn, time lapse, measures.
  (2) Judge 2: Measures Hold end of tape at ground, checks take-off, setting up and replacing bar.
- Judge 3: Measures reading of height, checks take-off, setting up and replacing bar, flags.
- Judge 4 (Recorder): Call-up, keeps record of trials, supervises warm-up. The Recorder records all decisions taken, or instructions given, by the Chief Judge.

## **General Rules and Regulations**

- Although a competitor may commence jumping at any height at his/her own discretion:
- At the competition area and before beginning the event each competitor may have practice trials, in draw order and always under supervision of the judges.
- If a competitor forgoes a trial at a certain height, he/she may not make any subsequent attempt at that height, except in the case of a tie for the first place.
- In all inter-schools meetings (Primary and High School) up to National Level, attempts are limited to 2 trials per height only.
- Once the competition has begun, competitors are not permitted to use the runway or take-off area for practice purposes.
- This deviation will not affect the credibility of results. It will reduce the injury risk of the athlete which has to participate in several events during the competition; it will reduce the length of the competition; and will increase spectator value.
- Three consecutive failures, regardless of the height, disqualify a competitor from further jumping except in the case of a tie for the first place.
- Two consecutive failures, regardless of the height, disqualify a competitor from further jumping except in the case of a tie for the first place.

# **A Competitor Fails If:**

- A competitor may place two markers alongside the runway.
- After a competitor has won the competition, the heights to which the bar is raised shall be decided by the competitor.
- After the jump, the bar does not remain on the supports because of the action of the competitor whilst jumping.
- Before the start of the competition, starting height and the subsequent heights shall be announced to the competitors.
- For consecutive trials by the same athlete when more than three athletes are still competing the time is 2 minutes, and 3 minutes if only 1 athlete is participating.
- He/she touches the ground, including the landing area, without first clearing the bar beyond the plane of the nearer edge of the uprights, either between or outside the uprights, with any part of his/her body, whether running up without jumping or in the act of jumping.
- If only one competitor is left the time should be increased to 5 minutes.
- In a combined event competition each increase shall be uniformly 3 cm throughout the competition.

- Measurement of each height shall be made before competitors attempt such height. In the case of records it shall be re-checked before and after each attempt.
- The bar should never be raised by less than 2 cm after each round.
- The Chief Judge shall vary the height against the national/provincial/competition record and clearly indicate the height as a new record on the results sheet before releasing it to the Competition Secretary.
- The competitor shall take off from one foot.
- The crossbar must be marked in some way so that after a failure it can always be replaced with the same side facing the runway and the same side at the top.
- The increment of the raising of the bar should never increase.
- Time allowed for a trial is 1 minute.
- When two to three competitors continue the time should be increased to 2 minutes.

# **Equipment for Chief Judge**

- Black ball point pen
- Clip board
- Entry ticket into competition area
- Flag (green/red)
- Markers
- Markers/powder for run-up area
- Measuring tape 3 m
- Performance board
- Programmers/Events list
- Result cards
- Step-ladder
- Stopwatch, batteries

## Conclusion-

The training stage is characterized by the systematic training of different elements and their various relationships, and may be regarded as special training, which should result in the coordinated execution of the sequence of movements. This training system should chiefly be used by the high jump specialist and provides the foundations for the special technical training