

Judo Ron 6

Presenting judo mechanics

When the judo teacher or Sensei is in his dojo elements, he should pay particular attention to the learning cycle of his students. The teacher provides the technical ground work through his demonstration, explanation and correction. The various activities taking place on the tatami and in the dojo provide the opportunities for experimentation, testing and acceptance of the judo culture. The end result should be to improve the technical skills and the intellectual processes so that there is a positive symbiosis between body awareness and cultural integration. Easier said than done you will say. The process is nevertheless very challenging and worthy.

The teacher has to implant a love of the sport activity and open the inquisitive process in his student. The latter must become capable of expressing his personality through the execution with ease his own techniques and still remain open to come forward to demand more explanations as required. It is thus important for the teacher to provide a clear and concise explanation-demonstration.

The delivery mechanisms used by the teacher can vary from the insight approach where the activity is first explained as a whole and then broken down in parts to highlight the main principles and then, rebuilding it and experimenting with it to remove the specific problems that may occur in actual practice. Another approach may be to start with one segment of the technique and add to it complementary activities or more difficult aspects built upon the demonstration that will enrich the former and lead to a total composite of the technique that can then tested in Randori or Shiai.

Since the normal judo classes are limited in time and space, it is important for the teacher to come before the class well prepared and knowledgeable of what and how he will reach his student. He needs to keep the safety of all the practicing judokas in mind and use the maximum amount of space to conduct the experimentation. At the same time, he should try to condense the theoretical explanations to their minimum so that the attention span of his class and the pace are properly maintained.

In the regular class, the recourse to make use of elaborate and lengthy mechanical explanations should be entertained with discretion. Most judo classes are made up of a mixture of students with different backgrounds and interests. Some may be stimulated by the detailed knowledge being passed down to them by the teacher while others could be turned off by it resulting in the teacher losing control of the class attention because of all the technical jargon. The technical presentation or explanation need to be concise and clear. Judoka learn more their skills through kinaesthetic sensations, repetitions and imitations thus translating what they see or what they are told in terms of what they can feel in their performance. The aim remains to give them all the opportunity to produce a habitual movement that provides satisfaction and comfort.

Mechanical analysis and detailed explanations surrounding their actions are perhaps best left to the more advanced students or to those wishing to introduce logic in order to correct their faults, improve all segments of their techniques and or satisfy their curiosity of what constitute the perfect throw.

Mechanical principles can be introduced as part of the delivery mechanisms chosen by the Sensei. He needs to decide what are the basic principles needed to highlight the technique he will demonstrate. As an introduction, he has several choices before him. He may choose the classic and simple grouping of techniques as found in the *Kodokan Gokyo* whereby each technique is presented from simple to complex in relation with the contact point actions performed by the one with the initiative or TORI. Techniques performed by or with the hands, the legs, the trunk or as sacrifices by falling sideways or to his back. Another approach is to make some references to the actions happening or having impact upon the receiving partner or Uke. Is the latter falling backward, forward, laterally, in front or at the side or at the rear? A third process is to describe the kinds of mechanical actions taking place when presenting a sudden obstacle before the opponent or striking him with a combination of forces, the use of leverages placed at different levels or performing a mixture of movements leading to the fall by turning, lifting, pulling or tripping the receiving partner.

It is my opinion, that whatever approach is selected, the Sensei must always break down the activity in three important parts: Kuzushi, the art of breaking the balance; the Tsukuri, the methodical and timely approach or displacement of the body and finally, the Take, which is the maximum use of the contact point on the opponent's most vulnerable zone. By demonstrating these components, he may select to garnish his explanations with more theory about the mechanical principles.

The selected technical demonstration chosen will be crucial. The total image of the technique must always be present in the mind of teacher, even when segmentation is taking place. Once completed, each student needs to experiment with the technique on his own and as often as possible and attempt to obtain a first feeling of it when performed at normal speed. Then, there should be room for observation and potential corrections. When enough dexterity is expressed, the student should be given the liberty to reproduce it at various speeds and under different situations such as when he will perform during *Geiko* and *Randori* practices.

Although imitation and repetition are indispensable for his development, each judoka will differ in the technical application because of the differences in the body masses, skeletal formation, degree of flexibility, age, gender, etc. The teacher has to accept these differences and try to work around these difficulties in order to determine what can be generally applied in order to improve their performances. Senior judokas can normally adapt and reproduce the technique with ease, while beginners will need to learn the principles and master those basics before venturing towards self expression in different surroundings. At the end of their apprenticeship, the mental stamina and will power might be the only things that will differentiate their performances.

To review the mechanical aspects one is reminded that in the performance of most judo movements it is possible to detect the involvement of the whole or parts of the human body. The linear motion also known as translation is characterized by the progression of the body in a straight line with all its parts moving the same distance, in the same direction and at the same speed. Different forces are combined to influence the progression and the body impact upon the training partner. Even if one seldom sees such a pure form of movement, it is important to understand for both the teacher and the student the principles components of a displacement.

The angular motions, the rotational or spiral directions performed by the body are more frequent sightings during the performance of judo techniques. Such displacements are dependant upon a system of levers that are constructed for each occasion, using the limbs or the trunk and employed according to the needs and strategies.

In angular motion, the body rotates along a fixed path or direction while the other parts such as arms and legs may be coordinated and coupled to reinforce the circular or helicoidally paths thus producing the effects of pushing, pulling or lifting the opponent.

The body is responding to the laws of nature when moving about. It may perform as a unified whole when all its parts are displaced equally in both times and distance. The technique will be weaker if the displacement or Shintai is not uniformed, that is when unequal distances are covered by the complementary parts during the same time frame. (This may occur when the body segments are ill-aligned or out of sequences)

It is therefore important to keep in mind the conceptions of the natural laws associated with inertia and motion. “*Minimum forces to be applied for maximum results*” and “*intelligent use of energy*” are the basic mechanical concepts expressed by Shihan Kano Jigoro.

Newton’s motion laws have exposed that the main sources of force are produced by the muscular components of the body, by the downward pull of gravity, the friction and by the up thrust emanating from the ground. In his first law, Newton stated: *Every body continues in its state of rest, or of uniform motion in a straight line, except in so far as it may be compelled by impressed forces to change that state.*

In the Kuzushi phase of a technique preparation, the actions of pushing, pulling, lifting or absorbing are necessary to overcome the state of inertia found on the opponent. When doing the demonstration, the teacher has to emphasize that it is more difficult to start making the opponent move and that a larger amount of force is necessary as compare to the application of lesser amount of energy to keep him on the move and use the momentum to combine his forces with yours for more efficiency. This can be explained by the fact that a greater force is needed to tackle both the inertia and the friction. If the opponent is on the move, then only a minimal amount of force is needed to make corrections to the friction resulting in a smoother throw.

Newton's second law can best be used to perform the Tsukuri or displacement of the body. It was said that: *The rate of change of momentum is proportional to the impressed force, and the actual change takes place in the direction in which the force acts.* Tori's timing and speed will be of the essence as this dynamic force can change the motion pattern of both players. As they both have to move in a given direction and with a certain speed, any exterior force applied by either of them can engender positive or negative results. If the attacker is faster and more direct, he will impose his dynamic force upon the opponent who will be required to display extra forces to extricate him from the effects of the momentum being applied against him.

The attacking force is producing not only a momentum, but it is also aimed at the weakest point, this is the Kake phase. All the converging forces are seeking a concentration area for maximum effect. It is to be noted that this point of impact need not be located and exercised against the opponent's centre of gravity. The converging forces produced by the displacement of Tori will create the same linear acceleration whether or not it is directed to the centre of gravity. Should the contact point selected be outside the centre of gravity, it will subject the opponent to react to that force differently and will induce a rotating effect along an axis passing through the centre of gravity and the opponent will eventually fall along a circular direction.

Newton further identified that: *To every action there is an equal and opposite reaction: or the mutual actions of two bodies in contact are always equal and opposite in direction.* Should the opponent desire to oppose the forces coming at him, he will need to change direction, present a smaller target area or deflect the incoming thrust. Should he decide to confront the incoming impetus he will require an equal or superior force to be applied in the opposite direction?

It is to be noted that ability to move the body around, need a certain amount of force. That force principally comes from muscle fibres tension and other combined forces arising from the gravity, the friction, the up thrust from the ground as well as from the opponent with whom we are engaged. Generally, forces can be felt but not easily seen. Their effects can be measured and described in magnitude, direction and point of application. From a simple mechanical point of view, a muscle most effective pull will be at right angles to the moving bone. But, as muscle fibres at such an angle are seldom fully stretched, the greatest effective force will usually be obtained when the angle of the pull is more acute. Maximum performance can be achieved by using different muscles groups in sequence and in coordination. In practice, the strongest yet the slower muscles surrounding the body's centre of gravity or trunk area should used first. We called the general use of these muscles, the *Haragei*. These massive muscles are joined at the trunk with abdominals and the other back and leg muscles, they make a powerful team. The weaker and lighter muscle groups such as those found at the extremities should be added and activated last and used more for control and direction giving purposes. It is said that the power should run out of the end of the toes and fingers. Ideally, all the forces deployed should be ending together. A short shout called *Kiai* representing the release of the inner energy should wrap up the disbursement of power.

Judo discussion and investigation of selected topics by Ronald Desormeaux

To wrap up this exposé, it is to be remembered that the Sensei's demonstration is important and that each technique has its own personality. It is named differently and executed in different patterns by a variety of people. Nevertheless, the basic principles found in the *Kuzushi, Tsukuri and Kake* will apply to all. The mechanical principles applied to all can be simply expressed, outlined or a detailed explanation given by choice of the Sensei to illustrate his teaching. Following the demonstration, the practice by the student of the given technique should be lively, energized and personal.