

CHAPTER I

INTRODUCTION

Playing game is the most important part of our life .It is an activity that involves individual and group. It makes us strong both physically and mentally. Sports help to keep our body fit and healthy. **“Quitters never win, and winners never quit.”**- This quote is aptly applicable for the sports players. There are lot of games which is played by men and women. Volleyball is mostly preferred by every individual because it is required minimum playing area with minimum equipments and also very less expensive cost. Volleyball is required with minimum players. Volleyball is not only famous in Russia, Italy, United States, Poland, Serbia, Argentina, Germany and Cuba, but also in India. Volleyball is a fast and exciting game. It can be just as thrilling to block the spike of an opponent, or defend a hard hit ball as it is to score a point with a powerful spike! This means that the game is noisy, energetic and exciting for all players! Next to our national game Hockey, Volley ball place top two popular sport in India, played in both rural as well as urban. It is a popular recreation sport. In India, volley ball is conducted as various categories like school zonal level & inter and intra college level tournaments. Players showed their interest right from childhood days. New techniques and well experienced coaches are introduced by Sports Development Authority like SAI, SDAT every year. The Sports Committee is authorized to modify the rules and regulations moreover its decisions are final.

India is ranked fifth in Asia and twenty seventh in the world in volley ball. This shows that our country has more efficient players, coaches like in Russia and United States. But, there are some factors in our Indian Volley ball players who are not able to

perform to the level of Olympic Games. According to the scholar, the Indian volleyball players have a very good physical fitness, systematic coaching, advanced trainings and sufficient practice duration like other country players; however, the Indians are unable to achieve the final laurels. So, the scholar is interested in analyzing the factors which influences the Indian volleyball players and suggests that the players need to improve the body-mind co-ordination and concentration to achieve stable success in volley ball. Psychomotor drill training and yogasana to the volley ball players are the two important highlights of his research work.

Researcher conducts many training programmes which mainly focused on importance of games, exercise, and yogasana. To experiment his proposed training, the researcher has selected the volleyball players from his working institution and started his research. He gives a systematic training that includes psychomotor drill and yogic exercises to those volley ball players for 12 weeks. This training proves to increase the body and mind coordination and concentration. As a result, it enhances the player's excellence in volleyball. In future these two trainings are going to be implemented also applicable for all the games just to enhance the performance of the players. With this perpectives the present research has been taken title of "Effects of psychomotor drills and selected yogic exercises on selected psychomotor skills and skill performance variables among inter -collegiate men volleyball players".

To study the impact of psychomotor drills and yogic exercises and the development of skill and drills. Following this concept related to the present study or described as follows.

1.1. SPORTS TRAINING

Sports training is a process of sports perfection directed by scientific and pedagogic principles and aims at leading a sportsperson to high and top level sports performance in a game or a sport or an event by means of planned and systematic improvement of performance capacity and readiness of performance (Uppal A.K., et al., 2004). The sport training aims at achieving high performance in sports competition. In order to achieve high performance, sports trainings are done in a well planned manner. The most suitable for achieving high performance has to be first made on the basis of which sports training is planned. It is based on scientific facts and principles. It is always assessed, planned, organized and implemented by a coach or a sports teacher. The important factors of sports training such as, frequency and length of the workouts, type of training, speed, intensity, duration, and repetition of the activity and competition should be carefully followed (Moses, Amrit Kumar R., 1995).

“Training is a systematic process of repetitive, progressive exercise or work, involving also learning process and acclimatization” (Arnheim, Daniel D 1985). Training is the process of preparation to improve the acquisition and development of new or already established skills so as to increase efficiency in the performance of particular tasks. It mostly involves structured repetitive routines that ensure the participants to progress their skills and knowledge. Training is a systematic scientific programme of conditioning exercises and physical activities designed to improve the physical fitness and skills of the players or athletes. Training is a systematic programmed planned to improve the proficiency over skills and develop the caliber of a sportsman for better performance in a particular game or a sport event.

1.2. VOLLEYBALL

Volleyball has developed into a highly competitive sport which requires a high level of physical, physiological and psychological fitness. The game at a high level of competition requires quick movements and fast reaction. Volleyball matches have no time limit and matches can last for several hours, if the teams are evenly matched. Successful play in volleyball is not the outcome of power alone but it is the product of the combined display of power and tactical abilities. Modern game of volleyball is characterized by accuracy, concentration and cleverness (Sharma, 1986).

Volleyball is a team sport in which two teams of six players are separated by a net. Each team tries to score points by grounding a ball on the other team's court under organized rules. It has been a part of the official program of the Summer Olympic Games since 1964. The complete rules are extensive. But simply, the play proceeds as follows: a player in one of the teams begins a rally by serving the ball (tossing or releasing it and then hitting it with a hand or arm), from behind the back boundary line of the court, over the net, and into the receiving teams court. The receiving team must not let the ball be grounded within their court. The team by touching the ball up to 3 times but individual players may not touch the ball twice consecutively. Typically, the first two touches are used to set up for an attack, an attempt to direct the ball back over the net in such a way that the serving team is unable to prevent it from being grounded in their court. The rally continues, with each teams allows as many as three consecutive touches, until either (1) a team makes a kick, grounded the ball on the opponent's court and winning the rally, (2) a team commits a fault and loses the rally. The team that wins the rally is awarded a

point, and serves the ball to start the next rally. The ball is usually played with the hands or arms, but players can legally strike or push (short contact) the ball with any part of the body (Weinberg, 1967).

1.2.1 SKILLS AND TECHNIQUES OF VOLLEYBALL

The game of volleyball is a fast moving energetic game demanding skill, strength, agility, team work and intelligence from its players. At its lowest level, it is an enjoyable, easily set-up game from which youngsters and beginners of all ages can quickly gain pleasure and satisfaction. With a short period after its origin, this game gained a wide popularity. A volleyball player is supposed to master six basic skills: serving, passing, setting, spiking, blocking and dig. Each of these skills comprises a number of specific techniques that have been introduced along the years and are now considered standard practice in volleyball.

1.2.2. SERVING

The serve makes the beginning of a rally in volleyball. A player stands behind the baseline and hits the ball, in an attempt to drive it into the opponent's court. His main objective is to make it landing inside the court; it is also desirable to set the ball's direction, speed and acceleration so that it becomes difficult for the receiver to handle it properly. A serve is called an "ace" when the ball lands directly onto the court or travels outside after being touched by an opponent. (Richard White, 2001). In contemporary volleyball, many types of serve are Underhand and Overhand Serve, Sky Ball Serve, Line and Cross-Court Serve, Spin Serve, Floater, Jump Serve, Round-House Serve.

1.2.3. PASSING

The pass is the attempt by a team to properly handle the opponent's serve or "free ball". Proper handling includes not only preventing the ball from touching the court, but also making it reaches the position where the setter is standing quickly and precisely. The skill of passing involves fundamentally two specific techniques: underarm pass, or bump, where the ball touches the inside part of the joined forearms, at waist line; and overhand pass, where it is handled with the fingertips above the head (Richard White, 2001).

1.2.4. SETTING

The set is usually the second contact when a team makes with the ball. The main goal of setting is to put the ball in the air in such a way that it can be driven by a spike into the opponent's court. The setter coordinates the offensive movements of a team. He is the one who ultimately decides which player will actually attack the ball. As with passing, one may distinguish between an overhand and a bump set. Since the former allows for more control over the speed and direction of the ball, the bump is used only when the ball is so low that it cannot be properly handled with fingertips or in beach volleyball where rules regulating overhand setting are more stringent. In the case of a set, one also speaks of a front or back set, meaning whether the ball is thrown in the direction the where setter is facing or not. Sometimes a setter refrains from raising the ball for a teammate to perform a spike and tries to throw it directly onto the opponent's court. This movement is called a "dump" (Richard White, 2001).

1.2.5. SPIKING

The spike (or attack) is usually the third contact a team makes with the ball. The object of spiking is to handle the ball so that it lands on the opponent's court and cannot be defended. A player makes a series of steps (the "approach"), jumps and then

projects his body forward, thus transferring its weight to the ball when contact is made. (Richard White, 2001). In contemporary volleyball, many types of serve are Back court attack, Line and Cross-court Shot, Kill, Dink, Tip, Cheat, Tool,Wipe, Off-speed hit, Quick hit, "One", Slide (Richard White 2001).

1.2.6. BLOCKING

Blocking refers to the actions taken by players standing at the net to stop or hinder an opponent's spike. A block is performed by jumping and raising one's arm over the net shortly before the ball is hit in an attempt to intercept its trajectory. A block that is aimed at completely stopping an attack, thus making the ball remain in the opponent's court, is called offensive. By contrast, it is called defensive if the goal is merely to make contact with the ball so that it slows down and becomes more easy to be defended. A "roof" is a successful offensive block. Blocking is also classified according to the number of players involved. Accordingly the three types of blocks are single (or solo), double, or triple block (Richard White, 2001).

1.2.7. VOLLEYBALL SKILL TRAINING

Volleyball skill training should be viewed as a sport activity with an educational purpose that is, fostering collaboration and teamwork, and teaching the importance of developing a strong body and a healthy mind. The strength and performance of children have been changing for the better. More generally, the physical performance consists of five elements: muscular strength, agility, general endurance, flexibility, and body control abilities. Of these, body control abilities such as timing, rhythm, balance, feeling of direction, concentration, and relaxation start to develop first. The fact is that consistent and well-planned coaching is necessary to achieve body control and attain ideal fitness in

volleyball. The most suitable time for players to develop these athletic and body control abilities is when they are young. If incorrect movement patterns are learned, considerable effort is required to correct them subsequently.

1.3 PSYCHOMOTOR

Psychomotor means a muscular activity associated with mental processes. According to The American Heritage Dictionary, "Psych" for d, and "motor" for the motor neuronal system in brain and spinal cord. "Broadly speaking, the mind is that which controls behaviour" (Uner Tan, 2007).

Psychomotor fitness plays an important role in everyday life activities of human begin. It depends on mental processes as well as on peripheral elements of the movement system. Psychomotor fitness plays a significant role in volleyball since during the game great changes in workload as well as frequent changes in game situations occur. In this form of fitness it is necessary to evaluate particular game situations thought fast, precise and valid cognition, reaction and anticipation of player's own activities with those of his partners and opponents. Psychomotor fitness is also necessary for information processing that enters the Central Nervous System and provides efficient decision making ability especially under conditions of increasing fatigue. The application for all these psychomotor abilities during a competitive game situation is related to optimal steering and regulation of motor activities of players.

Professions which require cognitive function and muscular coordination usually involve psychomotor ability to be showcased. Psycho-motor factor is probably the other commonly used factor employed for grading purpose in physical education. The skills in the activity, the fitness and game performance are measured under this factor. The grade

for each sport might be determined with several measures: a skill test, team work performance if the sports in team sports, tournament standing in individual sports and subjective analysis of the players ability to apply the sports. When skill test is not feasible, the player's ability in various skills of the sports can be measured by rating devices. (Uner Tan, 2007). Further psychomotor as the combined process of cognitive function perception, hand eye coordination and muscular coordination. Some of the profession in nature where these cognitive function and muscular coordination are basically a needed one.

1.3.1. PSYCHOMOTOR VARIABLES

The term "Psychomotor" is concerned with voluntary human movement, which is observable. Psychomotor variables are the variables bearing direct association with muscular skill, some manipulation of materials and objects and some act requiring neuromuscular coordination.

1.3.2. COORDINATION

Coordination is the ability to repeatedly execute a sequence of movements smoothly and accurately. This may involve the senses, muscular contraction and joint movements. It may be defined as the ability of the performance to integrate type of movements into specific patterns (Yobu, 1987).

1.3.3. HAND EYE COORDINATION

Hand eye co-ordination is the most important of complex learning's. The child has the ability to integrate such motion patterns contributes immeasurably by other learning's including intellectual developments of man's brain is highly correlated with refinements of manipulative movements (Singer, 1988). The co-ordination of hands, feet and even the

head with the eyes is one of the most important factors in performance of some motor skills. These include all movements involving a ball or similar object and are concerned with primary objectives such skills involving catching striking, hitting, kicking and heading are in this category .The eye must be trained on the primary objectives ,during the initial phase of movements and skilfulness in this factor requires steadiness, accuracy and control.

Hand-eye coordination is the ability to coordination of body parts movement (example movement of hand, eye, feet, etc) with one another and in relation to a definite goal oriented. Hand eye coordination may be defined as the coordination of the eye with the feet, hands, or head. The primary objective in Hand-eye coordination is to keep one's eye on the ball while the initial part of the body is in movement.

1.3.4 MOVEMENT TIME

The movement time is the time elapses from starting of the movement to the end of the movement. For example, in start, from the sprinters response to the completion of the race, the time recorded is the movement time, this caused by muscular force. There is a high relationship between reaction time and movement time.

1.3.5. BALANCE

Balance to body position referred to as balance, is necessary for the successful performance of sports skills. It is essential in those dynamic sports requiring sudden changing movements (Singer 1975). Balance is the body's ability to keep its equilibrium when stationary or moving keeping our equilibrium means keeping our centre of gravity over area of support. Balance is the ability to maintain body position which is necessary for the successful performance of sports skills. It is the ability of a sportsperson to maintain

equilibrium of the body both in static and dynamic conditions. All types of body movements are affected by this ability but it has a special importance when movements are done in a small area. This ability depends upon the functional capacity of vestibular apparatus.

1.3.6. STATIC BALANCE

Static balance is the ability to retain the centre of mass above the base of support in a stationary position. It is the ability to maintain one's balance when not in moving. It is also defined as being able to hold a certain position without moving. People use static balance all the time, and many examples can be found in someone's daily life.

1.3.7. DYNAMIC BALANCE

Dynamic balance is the ability to maintain balance with body movement; It is refers to the ability to move outside of the body's base of support, while maintaining postural control.

1.3.8. REACTION TIME

”Reaction time is dependent upon sense –organ and the peripheral location of factual stimuli.” It is a psychomotor variable and there are three types of RT, i.e. namely, simple reaction time, choice reaction time and discrimination reaction time .Simple reaction time is the time taken for reacting to a stimulus .Choice reaction time is the time taken for reacting to more than one stimulus, and discrimination reaction time is taken for reacting to all the stimuli given with appropriate responses. Reaction time is the time taken to react or to oppose or to defend a particular action. In other words it is a reflex action which is the interval between one set of stimulus and are set response”

1.4 YOGA

Yoga is the universal religion, a way of life, which is above all castes, creeds, languages, regions and nations. Yoga consists of eight Angas or Parts, namely, Yama, Niyama, Asana, Pranayama, Pratyahara, Dharana, Dyana and Samadhi. All these put together stands for yoga. Yamas and Niyamas are to be given to the children upto the age of puberty, that is, upto twelve years of age. Asanas and Pranayama constitute the aspect of physical training in the field of yoga. These should be introduced only from the age of twelve onwards and never before that age. Children under twelve possess a very mobile spinal column. Asanas are supplying agents and the children positively need only strengthening exercises and not supplying exercises at all (Sarma, 1994).

1.4.1 YOGA AND SPORTS

Physical preparation for maintaining optimum fitness, technical preparation for improving ones sports skills, and tactical preparation for developing strategy and tactical skills require a lot of time. Yoga is the most effective means in accomplishing the daily practice of mental skills. Incorporating one or two asanas into regular warm-up and/or cool-down routine provides several mental benefits in addition to the usual physical effects. The practice of attention-concentration relaxation (a mental skill) while simultaneously stretching and warming-up (or down) the body, increases flexibility and body awareness and also mentally tune one self. Yoga concentration is a "transition" to the concentration required (and so important) for performance or training. Also, just as warm-up and cool-down is part of the athletes' everyday routines, mental skill practice becomes a regular, systematic habit of the athlete (Aladar Kogler, 2003).

1.4.2. YOGIC EXERCISES

Yogic exercises are the ideal complement to other forms of physical exercises such as running, cycling and swimming (Sharma, 1984). Yoga postures are the physical positions that co-ordinate breath with movement and with holding the position to stretch and strengthen different parts of body. Yogic postures systematically work on all the major muscle groups, including the back, neck and shoulders, deep abdominal, hip and even ankles, feet wrists and hands. By their very nature, yogic exercises affect all the muscles groups and organs as they simultaneously impart strength, increase flexibility and bring nourishment to internal organs. Although most poses are not aerobic in nature, they do in fact send oxygen to the cell by way of conscious deep breathing and sustained stretching and contraction of different muscle groups.

1.4.3 PRANAYAMA

Pranayama, from prana and ayama, is the yoga science of breath control. The ancient yogis studied anatomy and discovered body and consciousness has reciprocal relationship between the emotions and breathing. It was found that when we are excited, our rate of respiration becomes faster. When we are composed, our breathing is slow, calm and rhythmical. The yogi seeks, by controlled and measured breathing, to influence consciousness itself. By control of the breath, the mind can be stilled and made one-pointed. Pranayama is a means to self - mastery and psychic powers (Kunal Nagi, 2012).

1.5 REASONS FOR SELECTION OF TOPIC AND VARIABLES

Sports provide a natural context to draw from training of psychomotor skills. It also provides a rich test based for research and training in psychomotor learning and

performance, in part because athletes and coaches have a “culture of practice” (McMahon, Helsen, Starkes and Weston, 2007) that other professions don’t have and partly because performance is so much more clearly observable and measurable in sports.

The investigator being an experienced physical director, closely associated with players and players found that when players were facing stress, the situation created among them are lack of emotional intelligence, problem solving ability, imbalances in temperaments, frustrated with tension. They are being advised to involve themselves in physical exercises to reduce their stress, which help to regulate their psychosomatic conditions. This made the researcher to think to develop a suitable psychomotor drills programme for these players. During the course of review of literature extensively, the researcher came across the benefits of yogic exercises in motor fitness, physiological and psychological variables also. Hence, in this study, the researcher was interested to test the influence of selected psychomotor drills and yogic exercises on selected psychomotor variables, such as, hand eye coordination, movement time, static balance, dynamic balance and reaction time and performance skill variables of volleyball such as, serving, setting, spiking, blocking and passing.

1.5.1 OBJECTIVES OF THE STUDY

For the purpose of this study the following objectives as follows:

1. The objective of the study was to formulate suitable psychomotor drills for improving selected psychomotor and skill performance variables of intercollegiate level men volleyball players.

2. This study was further aimed at selecting suitable yogic exercises for the benefit of intercollegiate level men volleyball players to improve their psychomotor skills and skill performances among intercollegiate level men volleyball players.
3. The study further aimed to test the influence of selected psychomotor drills on selected psychomotor and skill performance variables of intercollegiate level men volleyball players.
4. The objective of this study further included to find out whether psychomotor skill drills or yogic practices has more influence on selected psychomotor and skill performance variables among intercollegiate level men volleyball players.

1.5.2 STATEMENT OF THE PROBLEM

Psychomotor means a muscular activity associated with mental processes. Psychomotor fitness plays an important role in everyday life activities of human being. It depends on mental processes as well as on peripheral elements of the movement system. Psychomotor fitness plays a significant role in volley ball since during the game great changes in workload as well as frequent changes in game situations. Yoga is considered as the silencing of the mind's activities which leads to complete realization of the intrinsic nature of the Supreme Being. It is universal, benefiting people of all ages. In view of the above said theoretical foundations, the purpose of this study was to find out the effects of psychomotor drills and yogic exercises on selected psycho motor and skill performance variables among inter-collegiate level men volleyball players.

1.5.3 HYPOTHESES

For the purpose of the study the following were hypothesized:

1. It is hypothesized that there would be significant effect on selected psychomotor skills variables, such as, hand eye coordination, movement time, static balance, dynamic balance and reaction time among inter-collegiate level men volleyball players due to selected psychomotor drills and yogic exercises compared to control group.
2. It is hypothesized that there would be significant effect on selected skill performance variables, such as, serve, set, attack, block and pass among intercollegiate level volleyball players due to selected psychomotor drills and yogic exercises compared to control group.
3. Comparing between the experimental groups, namely, psychomotor drills group and yogic exercises group, it was hypothesized that there would be no significant mean difference on selected psychomotor variables, such as, hand eye coordination, movement time, static balance, dynamic balance and reaction time and skill performance variables, such as, serve, set, attack, block and pass among intercollegiate level volleyball players.

1.5.4 SIGNIFICANCE OF THE STUDY

The present study would be significant in the following points:

1. The result of this study would be beneficial for coaches, physical education teachers to identify the psychomotor abilities of the volleyball players.
2. The results of this study would be helpful to motivate the men volleyball players to involve in selected psychomotor drills to improve their performances in volleyball.

3. The findings of this study would be a contribution in the area of psychomotor domain and yogic exercises and might introduce new area of research for future researchers.
4. The Results of the study would be help for the players to identify their level of psychomotor skills and skill performance variables used in the study.

1.5.5 DELIMITATION OF THE STUDY

The present study was de limited to 130 inter-collegiate level men volley ball players studying in different colleges in Chennai in the age group of 19 to 25 years.

1. As psychomotor variables it was delimited to, Hand eye coordination, Movement Time, Static Balance Dynamic Balance, Reaction time
2. As skill performance variables it was delimited to serving, setting, spiking, blocking, passing.
3. As interventions, the present study was delimited to, Psychomotor drills and Yogic exercises
4. The duration of the interventions was fixed to 12 weeks.

1.5.6 LIMITATIONS

The Limitations of the present study as follows:

1. Factors like environment conditions, life style, playing ability, food habits were not considered which might influence the selected variables of the subjects.
2. The differences that existed among the subjects due to varied social, cultural, economic, religion factors were not considered.
3. All the subjects were taken from the same atmosphere of living.
4. The subject's academic standard and their economic status were not considered.

1.6 DEFINITION OF THE TERMS USED

The following definition of the terms in the present study as follows:

1.6.1 SKILL

The word skill could be defined as the learned ability to bring about predetermined results with maximum certainty and minimum outlay of time and energy (Reiley, 1996).

1.6.2. PSYCHOMOTOR

The term psychomotor refers to physical activity that is related to mental processes. Coming from the Greek word *psyche* (soul, breath, mind, life) and the Latin *motare* (to move) (Marcia Purse, 2014).

1.6.3. YOGIC EXERCISE

Yogasana are simple actions for keeping the internal and external parts of the body in good health. The third anga or limb of yoga is Asana. Asanas are postures that maintain equilibrium of body mind and spirit. There are literally hundreds of postures in asnas. Asana bring steadiness, agility, flexibility and so on. Thus, asana is one of the ancient yogic practices forming a base for all other practices and plays an important role in every kind of yoga sadhana. Asana is a special type of exercise, which is not only physical but also psychological in nature.

1.6.4 VOLLEYBALL

Volleyball is a team sport in which two teams of six players are separated by a net. Each team tries to score points by grounding a ball on the other team's court under organized rules (International Olympic Committee. 2007).

1.6.5 SERVING

The serve marks the beginning of a rally in volleyball. A serve is called an "ace" when the ball lands directly onto the court or travels outside after being touched by an opponent (Nadamala Gangadhara Reddy, 2009).

1.6.6 SETTING

The set is usually the second contact of a team makes with the ball. The main goal of setting is to put the ball in the air in such a way that it can be driven by a spike into the opponent's court (Nadamala Gangadhara Reddy, 2009).

1.6.7 SPIKING

The spike is usually the third contact of a team makes with the ball. The object of spiking is to handle the ball so that it lands on the opponent's court. The series of steps (the "approach"), jumps and then projects his body forward, thus transferring its weight to the ball when contact is made is called spiking (Nadamala Gangadhara Reddy2009).

1.6.8 BLOCKING

Blocking refers to the actions taken by players standing at the net to stop or hinder an opponent's spike. A block is performed by jumping and raising one's arm over the net shortly before the ball is hit in an attempt to intercept its trajectory (Nadamala Gangadhara Reddy, 2009).

1.6.9 PASSING

The skill of passing involves fundamentally two specific techniques: underarm pass, or bump, where the ball touches the inside part of the joined forearms, at waist line; and

overhand pass, where it is handled with the fingertips above the head (Nadamala Gangadhara Reddy, 2009).

1.6.10 HAND EYE COORDINATION

According to Singer (1968) in eye-hand co-ordination work is involved with eye-hand in combination, which is extremely complicated and requires an extended period of time to perfect.

1.6.11 MOVEMENT TIME

The movement time is the time elapses from starting of the movement to the end of the movement.

1.6.12 STATIC BALANCE

Static balance is the ability to maintain total body equilibrium while standing in one spot. The static balance is operationally defined as an amount of time taken to maintain total body equilibrium on stork stand test for a maximum possible time and was measured in the nearest one tenth of the seconds (Ted Baumgartner and Andres Jackson, 1987).

1.6.13 DYNAMIC BALANCE

Dynamic balance is the ability to maintain equilibrium while moving from one point to another. Dynamic balance is operationally defined as the number of steps taken with maintaining equilibrium (balance) on balance backward test at maximum possible steps and was measured as the eight maximum number of steps per beam.(Ted Baumgartner and Andres Jackson, 1987).

1.6.14 REACTION TIME

Reaction time is defined as the length of time elapsed between the presentation of the stimulus and the actual beginning of the movements. Reaction time is defined as the length of time that it takes to respond to a stimulus, that is., the time elapsed between the presentation of the stimulus and the actual start of the movement (Marget J. Safit, 1986).