

CHAPTER I

INTRODUCTION

Basketball is one of the most popular sports in the world. Participations of all ages have discovered basketball to be fun, competitive, educational, recreational and fitness oriented. Individual skills such as shooting, passing, dribbling and rebounding along with offensive and defensive teamwork are prerequisites for successful participation in the sport.

Although the traditional 5-on-5 game is probably the most popular basketball format over the year a wide assortment of fun basketball related games and competitions have evolved to help participants develop fundamental skills and knowledge. The type of game or competition played will depend on available equipment, player skill level and number of participants. Regardless of game or competition format, basketball participation can be enriching and provide lifelong enjoyment to participants who choose to “tie up the laces” and play the game.

1.1 GAME OF BASKETBALL

Basketball is a sport played by two teams of five players on a rectangular court. The objective is to shoot a ball through a hoop 18 inches (46 cm) in diameter and 10 feet (3.0 m) high mounted to a backboard at each end. Basketball is one of the world's most popular and widely viewed sports. A team can score a field goal by shooting the ball through the basket during regular play. A field goal scores two points for the shooting team if a player is touching or closer to the basket than the three-point line, and three points (known commonly as a 3 pointer or three) if the player is behind the three-point line. The team with the most points at the end of the

game wins, but additional time (overtime) may be issued when the game ends with a draw. The ball can be advanced on the court by bouncing it while walking or running or throwing it to a team mate. It is a violation to move without dribbling the ball, to carry it, or to hold the ball with both hands then resume dribbling.

Violations are called "fouls". A personal foul is penalized, and a free throw is usually awarded to an offensive player if he is fouled while shooting the ball. A technical foul may also be issued when certain infractions occur, most commonly for unsportsmanlike conduct on the part of a player or coach. A technical foul gives the opposing team a free throw, and the opposing team also retains possession of the ball. As well as many techniques for shooting, passing, dribbling and rebounding, basketball has specialized player positions and offensive and defensive structures (player positioning). Typically, the tallest and strongest members of a team will play the center or power forward positions, while slightly shorter and more agile players will play small forward, and the shortest players or those who possess the best ball handling skills and speed play point guard or shooting guard. (**Diana Star Helmer & Thomas Owens, 2000**)

1.2 HISTORY AND DEVELOPMENT OF BASKETBALL

In early December 1891, Canadian Dr. James Naismith, a physical education professor and instructor at the International Young Men's Christian Association Training School (YMCA) (today, Springfield College) in Springfield, Massachusetts was trying to keep his gym class active on a rainy day. He sought a vigorous indoor game to keep his students occupied and at proper levels of fitness during the long New England winters. After rejecting other ideas as either too rough or poorly suited to walled-in gymnasiums, he wrote the basic rules and nailed a peach basket onto a 10-foot (3.05 m) elevated track. In contrast with modern

basketball nets, this peach basket retained its bottom, and balls had to be retrieved manually after each "basket" or point scored; this proved inefficient, however, the bottom of the basket was removed, allowing the balls to be poked out with a long dowel each time.

The game basketball was created by Dr. James Naismith in 1891 to condition young athletes during the winter. It consisted of peach baskets and a soccer style ball. He published 13 rules for the new game. He divided his class of 18 into 2 teams of 9 players each and set about to teach them the basics of his new game. The objective of the game was to throw the basketball, into the fruit baskets nailed to the lower railing of the gym balcony. Every time a point was scored, the game was halted so the janitor could bring out a ladder and retrieve the ball. After a while, the bottoms of the fruit baskets were removed. The first public basketball game was played in Springfield, Massachusetts, on January 20th, 1892.

It was the YMCA that had a major role in spreading basketball throughout the United States, Canada, and the world. In 1893, Mel Rideout arranged the first European match in Paris, in Montmartre. At the same time, Bob Gailey went to Tientsin, China, Duncan Patton to India, Genzabaro Ishikawa to Japan, and C. Hareek to Persia. The First World War broke out in 1914, and the U.S. army started fighting in Europe in 1917. During World War I, American Expeditionary Force brought basketball wherever they went. Together with the troops, there were hundreds of physical education teachers, who knew Naismith spent two years with YMCA in France, in that period. Not only did they bring basketball with them, but also even the "modern" basketball, that is the game as it was played in the United States at that time.

After its arrival in Europe, basketball developed very quickly. In 1909 there was the first international match in Saint Petersburg: Mayak Saint Petersburg beat a YMCA American team. The first great European event was held in Joinville-le-Pont, near Germany, during the Inter-Allied Games. United States, led by future Hall of Fame player Max Friedman, won against Italy and France, and then Italy beat France. Basketball soon became popular among French and Italians.

1.3 BASKETBALL IN INDIA

In India, the game of basketball started its journey in 1930 when it was played for the first time. The first Indian National Championship for men was conducted in 1934 in New Delhi. The Basketball Federation of India (BFI), which controls the game in India was formed in 1950. Throughout history, Indians learned to appreciate the game because of its fast scoring and intense activity from the beginning until the end.

Nowadays, it is considered as one of the widely played sports in India. India is one those first few countries in the history of basketball that adopted the game within a few years of its inception and its teams actually consisted of five players on the court.

Basketball in India is played in most of the high schools, colleges and universities. There is considerable patronage for the game among the younger generation. Basketball in India is played by both men and women of all ages and ability. Many government institutions have professional basketball teams, who work for the institution and play for them: ONGC in Uttarakhand, Indian Overseas Bank in Tamil Nadu, Indian Bank in Karnatka, Mahanagar Telephone Nigam Limited in New Delhi, Indian Railways, and Kerala Electricity Board play for their respective institution and state.

There are many championships for senior, junior and youth levels for boys and girls. Invitational all-India tournaments like Master Prithvinath Memorial (New Delhi), Don Bosco Invitational Tournament (Mumbai), Ramu Memorial (Mumbai), and many other tournaments in the southern part of India are being organized every year. Unlike many other countries like America, Russia, China, and Japan, basketball in India does not follow seasons. Indian basketball has championships throughout the year for different age groups. Championship for youth is mainly organized between April to July when children are having summer break from school.

Being one of the earliest countries to adopt basketball, India has so far produced numerous talented basketball players, who have earned recognition in the international arena. Indian basketball players have also won several trophies for their country. There are several basketball players in India, who have been honoured by the government of India through the prestigious Arjuna Award and Dhyanchand Awards. Basketball in India is mainly being run and managed by a large number of national and state level associations, spread all over India. These basketball associations are working with a common view of popularizing the game in all parts of the country. Apart from that, developing the overall infrastructure for the game and uncovering new talent from the grass root level are some of the other principal objectives of the Indian basketball associations.

1.4 SKILLS IN BASKETBALL

Basketball is a fast-paced game that requires the knowledge and instinct to perform quickly and properly. The sport of basketball requires five basic skills. While some players might be more experienced with some skills than others, it is best to have at least some ability in all five areas.

1.4.1 Dribbling

Dribbling is an important skill for all basketball players. This skill will allow moving up and down the court, maneuver past defenders and execute plays. Proper dribbling requires ball-handling skills and knowledge of how to spread the fingers for ball control. It is also best if we know how to dribble equally well with both hands.

1.4.2 Shooting

In order to score points in basketball, we need to shoot the ball into the hoop. This requires the ability to properly hold and throw the ball into the air toward the basket while avoiding defenders. A proper shot requires precise aiming, arm extension and lift from the legs. There are different types of shots need to learn, including jump shots, layups and free throws.

1.4.3 Running

Running is a big part of basketball. In a full-court game, we will find our running back and forth as the game has quick transitions between offense and defense. When we have the ball, running will help to avoid defenders and get to the basket quicker. On defense, we often will find needing to run after the opponent, especially during fast breaks.

1.4.4 Passing

Passing is another skill that when mastered can help to become a complete basketball player. Basketball is a team sport that involves finding a teammate who is open for a shot. The ability to pass the ball to this player can make

the difference between scoring and not scoring. Really great passers are an important part of a basketball team and usually the ones who set up scoring plays.

1.4.5 Jumping

Jumping is another skill that can define how good a basketball player is. Jumping is involved in offense during the jump ball in the beginning, while taking shots and sometimes while trying to catch a pass. On defensive you will need the ability to jump when trying to block a shot or a pass. Being able to out jump your opponent for a rebound also is important.

1.5 REACTION TIME

In a game, most cuts and changes of direction occur when a player adjusts to another player or to the flow of play. Very rarely does a player have the luxury of knowing exactly where or when they will be running, stopping, starting or cutting until it's time to do so. It may seem like a basketball player would need to react only to visual stimuli, such seeing a defender shift to one side or an offensive player cut to the basket. However, other types of stimuli also require reaction, including audible and cognitive cues. Even on a predetermined play, reaction to all three stimuli is critical. For example, take a simple inbounds play. The inbound player must react first to the official's whistle signaling the start of the clock [audible]. Then, based on the play the team is running, they must survey the defense and determine where to throw the pass [visual]. After the throw-in, they must run to a spot or carry out an assignment to execute the play [cognitive].

Another point to keep in mind is that basketball players rarely start from a static, or standstill, position. To simulate game conditions to the fullest, perform reaction drills from different start positions. For example, running short sprints from

a lying down or prone position will improve a player's agility and reaction time when diving for a loose ball, regaining his or her feet and then sprinting down the court. Performing a Box Drop with Sprint will help a player get position to pull down rebounds.

There are seven identified co-ordinative abilities. These are:(1) Orientation ability (2) Differentiation ability (3) Coupling ability (4) Adaptation ability (5) Rhythmic ability (6) Balance ability (7) Reaction ability. All the co-ordinative abilities are important for learning of sports techniques and for their continuous refinement and modifications during long term training process. The motor learning ability depends to a large extent on the level of co-ordinative abilities.

Co-ordination ability means an ability to quickly and purposefully perform difficult spatio-temporal movement structures. Within this context, co-ordinationabilities are understood as an externally visible manifestation of the control and regulation processes of the motor activity of the central nervous system. The complex of co-ordination abilities consists of a group of basic co-ordination abilities.

Adaptive ability enables modifications of motor activity on the basis of comparison or anticipation of new or changing conditions during performing motor activity.

Balance ability is understood as an ability to keep body or its parts in a relatively stable position.

Combinatory ability is understood as an ability to simultaneously put partial movements together into more complex movement structures.

Kinesthetic differentiation ability means an ability to realize kinematic and dynamic features of movement.

Orientation ability is an ability to realize position of the body or its parts in space and time.

Rhythm ability enables to grasp and motorically express rhythm which is externally determined or contained in the motor activity itself.

Co-ordination abilities and affecting them are of twofold importance in sports:

- Their higher levels are a value in itself (a “skillful” individual is capable of better reactions to the need of changing the movement, its variability, speed or the speed with which the movement is performed).
- Developing them is a precondition for the quality of technical preparation and a good level of co-ordination abilities enables faster and better acquiring of sports skills.
- Technical preparation aims at perfection, technical mastery of a limited number of required motor skills, their automation and stability control.
- Stimulating co-ordination abilities consists in being introduced to many motor activities, whereas perfect mastery is not the aim, the aim being only a certain degree of automation.

Sensitive period for developing co-ordination is between 5 and 6 years of age (qualitative features grow: economy, fluency, precision) and around the age of 12; the highest values of agility indicators can be reached between 17 and 20 years of age.

Developing co-ordination abilities includes:

- Broadening motor experience (e.g. headstand or beating a rhythm with the right hand)
- Further, on the basis of already acquired motor experience, creating new original movement structure through the process of putting together mastered movements into more complex units (e.g. handstand, beating a different rhythm with the right and left hands)
- Performing movements in new changed conditions which require new creative problem solution (e.g. a sequence of handstand – forward roll or beating a changing rhythm with the right and left hands)

Specialized training negatively affects development of new movements (due to focusing on a limited number of motor skills which are the contents on selected sports specialization).

When executing "Co-ordination assignments" are determined first of all by the fact that they demand utmost concentration of attention. Subtle differentiations and regulations considerable with, alertness, creation or new forms of movements, co-ordination and what is more restructuring of the firmly-formed co-ordination links present a rather difficult task for the nervous system. Naturally it is best of all to tackle it at the beginning of the main part of the training session.

Co-ordinative abilities are primarily dependent on the motor control and regulation process of central nervous system. For each Co-ordination ability the motor control and regulation process function in a definite pattern when a particular aspect of these functions is improved then the sports-person is in a better position to do a certain group of movements which for their execution depends on the C.N.S. functioning pattern.

The co-ordinative function of the central nervous system and one of its properties which called plasticity are given a leading role in physical treatment of the essence of Co-ordinative abilities. The ability qualitatively to coordinate movements undoubtedly depends on the perfection of function of the analyzers.

To train such training means can also be used as ancillary means of fostering the improvement of analysers function while at the same time the athlete can stay relatively passive. The analysers as part of the whole neuromuscular system should be seen as a part of the "Physiological Substratum" of co-ordination. Their functions co-determines the level of the co-ordinative abilities. This should be taken into consideration and these means only applied as an additional means to develop these functions .

Insufficient training of co-ordinative abilities limits the performance ability specially at higher level. On the contrary, better developed co-ordinative abilities provide essential base for faster and effective learning, stabilization base for faster and effective learning, stabilization and valuation in technique and their successful execution in game situation. The quality of performance of all fundamental mechanical skills, the rhythm, flow, accuracy, amplitude etc. are improved by co-ordinative ability, it helps in developing very fine extra credible skills.

Today all over the world, physical educators and coaches are facing their greatest challenge in handling problems in scientific way, i.e., to give their sportsman proper and progressive guidelines based on scientific approach which lead to desired results.

Often it has been seen that in India, coaches and physical educators select only those training methods with which they are familiar, without the consideration of the proper effect of the training. Often training fails to accomplish the desired results because the coach or physical educator fails to recognize the training properly.

1.6 PRINCIPLES AND PROCEDURES IN TRAINING CO-ORDINATION ABILITIES

More demanding co-ordination exercises (activities requiring the activity of a bigger number of muscles, various movements of both the body and limbs, moves in different directions and along different axes) are used for co-ordination abilities development. Mastered exercises are performed under changing conditions because automated skills do not lead to further development of co-ordination abilities.

A variation can be reached by:

- faster or slower performance
- change of rhythm
- making the work-out space smaller
- limiting or eliminating visual control

- making the ground of support smaller
- exercising “under pressure” (in limited time)
- asymmetric movements
- mirror movements
- mastered skills are combined and connected
- full concentration, precision and rhythm are focused on
- the contents of motor activity and its difficulty is stressed and dominant
- fewer repetitions are used (reason: fatigue decreases efficiency of stimulation)
- they are scheduled for the beginning of a training session

The wider the motor contents of a sports discipline are and the more complicated and faster locomotion is (relocating in space) and the more difficult, faster and complex manipulation with tools or devices is (movements of upper limbs), the bigger the requirements for co-ordination are.

- acrobatic exercises (rolls, take-offs, skips, linked exercises)
- exercises with apparatus (rotation exercises, shapes)
- exercises with tools (skipping ropes, balls, cones, co-ordination ladder, bosu)
- stride variations

- exercises related to overcoming hurdles (slalom tracks, hurdle tracks)
- minor resistance exercises

1.7 SYSTEM OF THE CO-ORDINATIVE ABILITIES OF THE ATHLETES

The characteristics and the structure of the co-ordinative abilities (CA) of the athletes are an involved problem of the sport science. The cause for the existing indefiniteness is the lack of theoretic position in the research of these abilities. Movement co-ordination can be understood as process of steering and regulating. The cybernetics - a science for the control of the complex dynamic systems is the most appropriate theoretical basis of investigation the CA.

In order to determine the characteristics and the structure of the system of the CA, the cybernetic model method was applied. The human organism was examined as a complex system of movements control. The physiological functions of the human motor system and the sensory systems were analyzed by the cybernetics position. As a result, the functional structure of the control system of the movements was identified.

Components of the complex system are the simple systems of regulation. We identified fifteen different kinds of systems of regulation, which also means that fifteen different co-ordination abilities exist. They are connected to each other in a hierarchy of five levels.

Level I - Abilities to regulate the behaviour of the muscle fibres

1. Regulation of isometria of the muscle fibres is the ability to preserve the constant length of the muscle fibres - constant value control. This ability gives the elasticity of the muscle tissue.
2. Regulation of the contractions of the muscle fibres is the ability to regulate the contractions of the muscle fibres - programmed control. This ability makes it possible to change the muscle strain.

Level II - Abilities to regulate the strain of the muscles

3. Regulation of the muscle isotonia is the ability to preserve the constant muscle strain - constant value control. For example, in performing all static physical exercises.
4. Regulation of muscle auxotonia is the ability to regulate the changes in the muscle strain - programmed control. This ability determines the performance of all dynamic physical exercises.

Level III - Abilities to regulate the movements of the body parts.

5. Regulation of the position in the joint is the ability to preserve the static position of the body parts - constant value control. The feedback is through the static articular afferentation. For example, in performing level hang on the rings in gymnastics.
6. Kinesthetic-motor regulation is the ability to regulate the three - dimensional movements of the body parts - programmed control. The feedback is through the dynamic articular afferentation. This ability determines the correct form of the exercises in gymnastics.

7. Temporal-motor regulation is the ability to regulate the duration of the body parts movements - programmed control through the perceptions for temporal dimensions of movements. This ability determines the rhythm of the movements performed without musical accompaniment.
8. Imitation-motor regulation is the ability to perform movements, re-create the form of another performer's movements - sequential control. This ability determines the learning of sport-technical elements by athletes by demonstration patterns, but it is not identical with motor learning ability.
9. Accoustic-motor regulation is the ability to perform rhythmic movements of the body parts in synchrony with rhythmical sound patterns (the music accompaniment) - it is sequential control through the hearing perceptions of dismemberment of the sounds in time. For example, in synchronized swimming, dances, etc.

Level IV - Abilities to regulate the movements of the whole body.

10. Regulation of the body balance is the ability to preserve the equilibrium of the body - constant value control of the position of the body in the earth gravitation. For example, the handstand and the forward horizontal stand.
11. Regulation of the body rotations is the ability to regulate the rotation movements of the body. The feedback is through the labyrinth afferentation. It is programmed control. For example, somersault in diving, double loop in figure skating, etc.

12. Visual regulation of the locomotions is the ability to change the direction of the locomotions - sequential control of the body moving in the surrounding through the visual perceptions of movements of the observer. For example, in ski slalom, orienteering, etc.

Level V - Abilities to regulate the movements of mobile objects.

13. Manual-stabilizing regulation is the ability to fix mobile objects (sport apparatus, or the body of the partner in acrobatics, etc.) holding them with the hands. It is constant value control. The feedback is through the tactual sensitivity. For example, holding a barbell with the hands.
14. Tactual regulation of manipulations is the ability to regulate the movements of mobile objects with the hands in relation to one's own body - programmed control. The feedback is through the tactual perceptions for movement of mobile object. For example, performing stereotype manipulations with sport apparatus - as dribble in basketball.
15. Visual regulation of manipulations is the ability to regulate the movements of mobile objects from one place to another (in relation to the surrounding) depending on the situation - sequential regulation through the visual perceptions of movement of mobile object. For example, passing the ball in football and shooting the ball in basketball, etc.

1.8 CO-ORDINATION ABILITIES IN PHYSICAL EDUCATION

The word 'physical' refers to the body, and indicates bodily characteristics such as strength, speed, endurance, flexibility, health co-ordination

and performance. It seemingly contrasts the body with mind. The term education when used in conjunction with physical refers to a process of 'education' that develops the human body especially, and the movement skills. Therefore, it transcends all misconceptions and misgivings about physical education as a field of teaching and an ingredient of general education.

Human being is an integration of the body and mind. Both components through their combinations make him more successful. The mental process and the physical expression are beautifully interwoven in the mechanism of the whole man and his wholeness in no case should be made to suffer by separating mental and physical aspects.

Man's life is a continuous flow of activity. Every moment man is doing something and his every activity is the result of the joint efforts of the body and mind; more integrated efforts yield more success to the individual. Things in this world, outside ourselves, come via the body (some organs) into our mind and things in our mind reach the world outside through the body.

The concept of performance related fitness is an elusive term that has been studied extensively over the past several years, and it has been classified by some experts as an aspect of physical fitness. Balance, co-ordination, agility, speed of movement, and power are among the most frequently cited components of performance-related fitness.

Co-ordination motor abilities are particularly important at the initial stages of the sports development of a competitor. A high level of co-ordination improvement since the earliest years makes it possible to make use of technical and tactical skills during a sports competition effectively. A well-formed basis of Co-ordination motor abilities in young sportsmen is maintained at a later age and is an

important reason for faster and more accurate teaching of other, more difficult movement tasks.

Especially in sports, in addition to mobility, the co-ordinative abilities strength, endurance, speed abilities and constitutional conditions are the prerequisites for developing high athletic performance. Starting from a high level of co-ordinative abilities, athletes can learn and improve athletic motor abilities and techniques that are required for the specific sport more quickly and with a higher degree of quality.

“Training of proprioception means primarily the training of balance ability. It aims specifically at the improvement of depth perception and the resulting reflex muscle activity and concerns partial aspects of the overall co-ordinative abilities.”

If human beings have to find their balance on an unstable surface, an intra- and interco-ordinative reaction of the muscles occurs, which is necessary for maintaining balance. As with proprioception, balancing ability plays a very important role in overall co-ordination, because the control of movements would be seriously affected without it. This means that balancing ability is also improved and extended through training of proprioception, by being able to learn new movements.

Co-ordination means working of all the muscle groups of the body in union. It is of utmost importance in executing any movement with a predetermined objective. Between the muscles groups, co-ordination are divided into inter muscular co-ordination and intra muscular co-ordination. It means co-ordination between different muscle groups as well as between muscle fibres of the same muscle. Co-ordination is necessary to execute movements requiring speed and strength and more efficiently, therefore, with less expenditure of energy, showing a better performance

over a longer time. A person starts losing co-ordination once he gets tired and vice-versa, a tired person cannot learn movements needing a high degree of co-ordination.

Co-ordination is the ability to integrate separate motor systems with varying sensory modalities into efficient movements. The harmonious working together of the synchrony, rhythm, and sequencing aspect of one's movements is crucial to coordinated movement. Various parts of the body may be involved, such as eye-foot co-ordination, as in kicking a ball or walking upstairs. Eye- hand co-ordination is evident in fine motor activities such as bead stringing, tracing and clay modeling or in gross motor activities such as catching, striking or volleying a ball.

Hand-eye co-ordination is the ability of the vision system to co-ordinate the information received through the eyes to control, guide, and direct the hands in the accomplishment of a given task, such as punching or defending in combat sports. Hand-eye co-ordination uses the eyes to direct attention and the hands to execute a task. Fine motor skills are involved in the control of small muscle movements, such as when an infant starts to use fingers with a purpose in co-ordination with the eyes.

Co-ordinative ability should not be equated with motor skills. Though both are inter related and inter dependent upon each other, they are determined by the motor co-ordination process. In a motor skill movement process of body parts are largely automatised for the execution of the particular movement.

The co-ordinative abilities play a vital role to increase the efficiency. To acquire efficiency, we require skilled and efficient potentials, for skilled and efficient potential co-ordinative abilities are very important and a pre-requisite for performance. It will be useful to children for various sports techniques and for their continuous refinement and modification during the long term training process.

Co-ordinative abilities are pre-requisites of athletics performance; these are mainly coordinated by motor control process. Athletes' co-ordinative abilities help them in learning and perfecting technical skill in the training period the co-ordinative abilities determine the speed of quality of learning, stabilizing and applying the techniques of sports in co-ordinative abilities which differ from technical skills that are prerequisite for several motor abilities.

The optimal age for motor learning is difficult to define. The conditions seem the best up to early adulthood; however lifelong sensitivity allows motor learning process to continue throughout one's life, in the presence of frequent repetitions and appropriate motivation, depending on the difficulty of the learning task. The periods before puberty are nevertheless to be used particularly intensively for appropriate stimuli (especially with regard to co-ordination and speed), because it makes sense to influence the maturing functions. It has been also proved that co-ordination abilities can be trained particularly well at this age. However this does not mean that no effects can be achieved at more advanced ages. Broad co-ordination seems to be favourable for later success in motor learning.

In co-ordination ability, the control regulation processes are required to function in a particular manner, which is further automatized to a great extent during skill performance.

Co-ordinative abilities have also important and strong links with the motor skills as motor co-ordination forms the basis of the both. Co-ordination abilities are understood as relatively stabilized and generalised patterns of motor control and regulation processes. These enable the sportsman to do a group of movements with better quality and effect.

In fact co-ordinative abilities are understood as stabilized and generalized patterns of motor control and regulation processes. These enable the sportsman to do a group of movements with better utilization and effects. The development of co-ordinative abilities is important for all sports, but in particular for the technical sports, competitive games and for the combative sports.

Seemingly, co-ordinative abilities have no essential significance in sports with standard structures of the movements and relatively constant permanent competitive conditioning. However, purposeful development of co-ordinative abilities in the given case is one of the determining aspects of sports functioning, on which above all depends the level of the sports technical and tactical mastery. If account is not taken of this, constant specialization in standard form of movement will lead to stagnant motor skills and will narrow the very possibility of their restructuring and renewal.

Co-ordinative abilities are primarily dependent on the motor control and regulation process of central nervous system. For each co-ordinative abilities the motor control and regulation process function in a definite pattern when a particular aspect of these functions is improved then the sportsperson is in a better position to do a certain group of movements which for their execution depends on the CNS functioning pattern.

The theories of motor co-ordination, therefore, are the best for understanding the nature of co-ordinative abilities. For each co-ordination ability, the central regulation process functions in a definite manner. When a particular aspect of this function is improved, the sportsman is in a better position to do a certain group of movements which for the execution depends upon the type of the central nervous system function pattern.

Efficiency requires good co-ordination between the body and mind. Lack of co-ordination results in unskilled or poor movements which is dominated by cortical control that supersedes reflex and integrated mechanism.

In technical sports beautiful and graceful movements are a product of well developed technical skills and co-ordinative abilities which to a great extent determine the maximum limits to which sport performance can be improved in several sports especially the sports which depend largely on technical and tactical factors. When executing ,“co-ordination assignments” are determined first of all by the fact that they demand utmost concentration of attention, subtle differentiations and regulations considerable with, alertness, creation of new forms of movements, co-ordination and what is more restructuring of the firmly-formed co-ordination links present a rather difficult task for the nervous system. Naturally it is the best of all to tackle it at the beginning of the main part of the training session.

The co-ordinate function of the central nervous system and the one of its properties which Ivan Pavlov called plasticity are given a leading role in physical treatment of the essence of co-ordinative abilities. The ability qualitatively to co-ordinate movements undoubtedly depends on the perfection of the function of the analyzers.

Such training means can also be used as ancillary means of fostering the improvement of analyzers' function while at the same time the athlete can stay relatively passive. The analyzers: as part of the whole neuromuscular system should be seen as a part of the “Physiological Sub- stratum” of co-ordination. Their function co-determines the level of the co-ordinative abilities. This should be taken into consideration and these means only applied as an additional means to develop these functions.

Insufficient training of co-ordinative abilities limits the performance ability specially at the higher level. On the contrary, better development co-ordination abilities provide essential base for faster and effective learning, stabilization and valuation in technique and their successful execution in game situation. The quality of performance of all fundamental mechanical skills, the rhythm, flow accuracy, amplitude etc. are improved by co-ordinative ability; it helps in developing very fine extra credible skills.

Co-ordination is important for the development of combat sports; the co-ordinative abilities play a vital role during practice and competition situation. In Judo, Boxing and Wrestling, as we know, the performance is significantly based on co-ordinative abilities, like reaction time, balance, rhythm, orientation etc., in Judo during uchikomi (repetition practice) the rhythmic ability and coupling ability plays a major role as the technique to be perfected by repeating the movement a number of times. Kuzushi (off-balancing the opponent) is one of the pre- requisites for applying a successful throw which needs the attacker to be in good balance and posture. A learned judokas uses his reaction to get advantage of the opponent's slow and improper attacks in applying counter throws. In the game of Judo, after each bout, a judoka fights against a new opponent of different height. Posture measurement adds to some extent different weight (specially in open weight category) that enable him to adjust and transform his grips, techniques, postures and movement depending on the opponent, hence to meet such situation, he requires a top class differentiation ability. During the osaewaza (ground work) there are numerous situations when a judoka tries to hold the opponent, and the opponent lying below is unable to see the movements and positions adopted by the inclination of weight and body parts of the opponent touching him; it is where he uses his orientation abilities to defend himself from holding, locking and chocking technique.

Wrestling belongs to the group of sports disciplines with complex movement activities in which an essential role is played by co-ordination motor abilities. A high level of co-ordination improvement, since the earliest years, positively influences the process of learning new movements as well as enables to make a more effective use of technical and tactical skills during a sports fight. Therefore, the formation of co-ordination abilities, since the earliest years, is the condition of training young wrestlers effectively.

The continuously changing life process creates different needs and emphasis for different individuals, as they grow older. There is an optimum level of fitness for different age groups, and for better understanding of physical fitness the components of physical fitness must be known. The components of physical fitness as listed by Lason and Yocomare: Resistance to diseases, muscular strength, muscular power, muscular endurance, cardiovascular endurance, flexibility, speed, agility, co-ordination, balance and accuracy.

An individual with a high level of motor ability, possessing the basic motor qualities necessary for achieving excellence in a number of activities, may still be unable to perform well in a particular sport unless he has developed specific skills for that sport through long hours of practices.

In technical and combat sports, beautiful and graceful movements are a product of well developed technical skills and co-ordinative activities. The co-ordinative abilities, to a great extent, determine the maximum limits to which sport performance can be improved in several sports, especially the sports which depend largely on technical and tactical factors.

Experts in training recently have been using the term 'technique, and co-ordinative abilities together as one performance factor (technique co-ordination or

technique /co-ordination), since both are interrelated and interdependent. They have in common the process of the taking in and processing information for the regulation of action which enable the sportsman to direct and control his movement according to changing situation. Both these qualities postulate co-ordination of the nervous and muscular systems. The learning of motor movement has positive effect on co-ordination abilities necessary for the perfection of sports technique. Still these two qualities differ in the degree of their general training, methodic and the level of development. In case of motor skill, processes are largely automatised for the effective execution of a wide number of movements similar to each other.

Co-ordinative abilities play an important role in quick changing of body position during game. In some sports, like combative sports, co-ordinative abilities are very essential for better and effective movement for any execution of movement. In sports, co-ordinative ability or the combination of various co-ordination abilities play a vital role for the execution of any skill or movement. The combination of various co-ordinative abilities is helpful for the execution of any movement or skill.

The co-ordinative ability plays a significant role in learning consolidation and mastery of skills. Punch and defense occur frequently in boxing and it is assumed that these skills may have strong relationship with co-ordinative abilities. In other combat games like judo, wrestling etc, the player gets very limited time to perform, and enhanced reaction ability plays a vital role. Besides reaction ability, the other abilities, namely Balance, Rhythm, Coupling, Adaptation. Orientation ability, Balance ability play a vital role in the performance of skill in the combative sports.

Motor co-ordination is a part and parcel of action regulation and is closely linked with the process of cognitive, psychic and movement execution aspect of an action. Co-ordination abilities have also important and strong link with motor skills as motor co-ordination forms the basis of both. Co-ordination has been one of

the key factors in terms of performance skill in efficient manner. It is generally seen that top level players possess abundance of co-ordination for developing skill in a variety of ways.

Combat sport is a competitive contact sport where two combatants fight against each other using certain rules of engagement, typically with the aim of simulating parts of real hand of combat. Judo, wrestling, boxing, mixed martial arts and fencing are examples of combat sports. The techniques used can be categorized into three domains: grappling, striking and weapon usage. Some rule- sets specialized in one area, while others allow overlap. Sports related to combat skills have been a part of human culture for thousands of years. The ancient Olympic Games were largely composed of sports that tested skills related to combat, such as armoured foot race, wrestling, boxing, pankration, chariot racing amongst others. This tradition of combat sports was taken even further by the Romans with gladiators who would fight with weapons, often to the death. Through the middle Ages and Renaissance the Tournament became popular, with the joust as a mine event. While the tournament was popular amongst aristocrats, combative sports were practised by the all levels of society.

Combat sports occupy a significant place among sports and games. It is a game of anticipation and masterful skill, deception and concentration. It requires mental and physical attributes to be in the top gear to tackle all eventualities in a bout. A bout is won by the perfect amalgam of physical condition, skills, experience and most importantly, the co-ordination.

1.9 STATEMENT OF THE PROBLEM

The purpose of the study was to find out the diagnostic of co-ordinative ability of basketball players at junior level in Tamil Nadu.

1.9.1 Hypotheses

Based on the available literature and investigator's own experience and knowledge in the area of the study it was hypothesized that,

1. There would be no significant difference of co-ordinative abilities of beginner level basketball players at junior level boys and girls.
2. There would be no significant difference of co-ordinative abilities of district level basketball players at junior level boys and girls.

1.9.2 Significance of the Study

1. It would be helpful to differentiate co-ordinative abilities possessed by different levels of players.
2. Study may be useful in classification of student on the basis of co-ordinative abilities.
3. The outcome of the study may be useful in evaluating the degree of adaptive changes in learning a game.
4. Results of the study may be helpful for the self-assessment of the basketball player at beginner and district level.
5. The study will help the physical education teacher, coaches and trainers to concentrate on the co-ordinative abilities of the basketball player during their training session.
6. This study may also help in further comparing the percentage of co-ordinative abilities required in the team sports for maximum performance.

7. Results of the study may give the knowledge about particular type of co-ordinative ability needed for basketball.

1.9.3 Limitations

The following limitations are taken into consideration in the study,

1. The effect of uncontrollable factors like lifestyle, food habits and climate conditions.
2. No effort was made to motivate the subjects which might have effect the results of the study.
3. Heredity factors which may influence the selected variables could not be controlled.

1.9.4 Delimitations

1. For the study school boys and girls at junior level were selected as subjects.
2. The age group of the subjects ranged from 12 to 14 years.
3. It was delimited to five co-ordinative abilities, namely
 - Reaction ability
 - Orientation ability
 - Differentiation ability
 - Balance ability
 - Rhythm ability

1.9.5 Definition and Explanation of the Terms

1.9.5.1 Co-ordinative abilities

“Co-ordinative abilities are understood as relatively stabilized and generalized pattern of motor control and regulation process”. These enable the sportsman to do a series of movements with better quality and effect.

1.9.5.2 Reaction ability

“It is the ability to react quickly and effectively to a signal”.

1.9.5.3 Orientation ability

“It is the ability to determine and change the position and movements of the body in time and space in relation to a definite field of action”.

1.9.5.4 Differentiation ability

“It is the ability to achieve a high level of fine tuning on harmony of individual movement phases and body part movements”.

1.9.5.5 Balance ability

It is the ability to maintain balance during whole body movement and to regain balance quickly after the balance disturbing movement.

1.9.5.6 Rhythm ability

It is the ability to perceive the externally given rhythm and to reproduct it in motor action.