CHAPTER-I

INTRODUCTION

1.1 General Introduction

With advancement of age, there has been a surge of interest in the growth and motor development of children. Physical Educationist, other scholars and others like psychologists, physiologists, physicians, coaches, etc. have become more aware of the need for accurate information about the process of growth and motor development and its influence on the developing child (Gallahue, 2003).

Growth patterns are generally controlled by genetic makeup at birth. Although unfavourable environment is having negative impact on proper growth and development. All youngsters follow a general growth pattern; however, for each child, timing is unique. Some children are advanced physically for their chronologically age, whereas others are slow matured. No two individuals are alike and although extreme deviations are always be present, the most still may be considered as normal. ‘Normal’ may then be constructed to mean that children have basic characteristics that fall within broad ranges on the continuum; care should be exercised in categorizing each child properly according to the exact phase of growth and development he is experiencing.

Although we may conceptualize general developmental patterns and growth cycles for different age periods. It is realized that each person develops and grows in his or her own unique way. Each individual’s development requires to be studied in terms of his or her own individual growth pattern.

The development of all human beings follows a similar pattern on a sequence. These patterns are of two types: a) Cephalo-caudal and b) Proximo-distal sequence. Cephalo-caudal sequence means individual begin to grow from head region to downward i.e., body parts away from the head, develop at last.
Proximo-distal sequence means spinal cord of the individual develops first and then the development distal parts takes place (Sharma, 2000).

Movement has an obvious role in the perceptual-motor process, which is a process of attaining increased skill and improving the ability to the function. In games and sports as well as in daily living, movement is the basis of nature. With advancement of time our living pattern and standard has been changing, however, the movements those are fundamental in nature remain unchanged. Necessity of exercise being increasingly realized in the technologically advanced age and exercise has become an effective means for one’s optimum functioning as well as development in the four learning domains i.e., cognitive, psychomotor, affective, and health-related physical fitness domains. It is known that a sound mind in a sound body is necessary for a child to manifest his potentialities to the fullest.

The word ‘perception’, which means awareness or interpretation of information, refers to the process of organizing and synthesizing information that one gathers through the various sense organs with stored information or past data, a process that leads to a modified response pattern (Gallahue, 2003).

The stages of motor learning are having three phases – (a) cognitive phase (b) associative phase and (c) autonomic phase. In cognitive phase the learner perceives the movement patterns; in associate phase the learner organizes the different parts of a whole movement and in autonomic phase the learner makes attempt to reproduce the movement with less hindrances in the motor behavior like walking, running, throwing, etc. (Wikipedia, 09.2.2011).

The role of perception and its importance in motor learning and performance is greatly recognized. Although perceptual learning has been studied separately from learning in general; there is no doubt that one refers to the learning of athletic skills as motor learning. Perceptual mechanisms operate in precluding and skilled motor act or subsequent to them. A person’s ability to receive and distinguish among available causes in a given situation enables him to perform more skillfully (Singer, 1968).
The term ‘perceptual-motor’ signifies the dependency of voluntary movement activity on sensory information. All voluntary movements involve an element of perceptual awareness resulting from sensory stimulation. The second part of the term indicates that the development of one’s perceptual abilities depends, in part, on movement. The reciprocal relationship between sensory input and motor output enables perceptual and motor abilities to develop in harmony (Gallahue, 2003).

The terms ‘learning to move’ and ‘moving to learn’ embody the general aims and goals of Physical Education. The movement activities children engage in play have an important role in their physical fitness as well as in movement skill learning. In short, they learn to move with joy, efficiency, and control. The interrelated nature of the motor, cognitive and affective aspects of developments are given due importance in learning through Physical Education curriculum. Among the various characteristics of early childhood (ages 3-7 years) and later childhood (ages 8-12 years) motor characteristics that change during each of these periods are the rate of growth, the development of movement abilities, and motor control. Some cognitive characteristics are related to the ability to express thoughts and ideas and development of the ability to think. Some important affective characteristics related to the self-concept, sense of competence, and the ability to get along with and interact with others (Gallahue, 2003).

Certain combinations of abilities contribute to successful learning of tasks at various stages of learning. For example, non-motor abilities such as verbalizing may play a more important role in the early learning stages while later stages in learning, task-related factors may play the vital role (Fleishman, 1966).

‘Motor fitness’ is an important component of physical fitness; it may be defined as a readiness of the body for performance with special regard to big muscle activities without undue fatigue (Barrow, 1983). It is concerned with the capacity to move the body efficiently with force over a reasonable length of time. ‘Motor fitness’ is a standard measured by performance and this performance is
based on a composite of many factors or components such as speed, agility, power, co-ordination, balance and simple reaction time.

Motor ability extensively includes a combination of abilities that contribute to motor skill or motor performance. Continued practice brings about changes in the combination of these abilities. Motor abilities become more important in task performance than non-motor abilities and task specific factors emerge with practice (Fleishman, 1964; Singer, 1980).

The term ‘kinesthetic perception’ is also an important aspect physical education to predict cognitive level of an individual. The term ‘perception’ refers to the meanings that by which information is acquired from the environment via the sense organs are transformed into experiences of objects, events, sounds, tastes, etc. Perception may be defined as knowledge thorough the senses of the existence and properties of matter and the external world (Singer, 1968). In spite of the fact that perception can be studied in each of the sensory modalities, it is actually the case that most researches and theories have focused on auditory and visual perception. It assumes that perception involves conscious awareness, but there is increasing evidence that extensive perception processing can occur in the absence of conscious awareness. ‘Kinesthetic perception’ is the ability to perceive the position, effort and movement of parts of the body or the entire body during muscular action. It is sometime referred to as the sixth sense (Johnson, 1970).

In reality, we have more than just six senses, in fact, kinesthetic sense could be considered as several senses within itself. The term ‘proprioceptive’ sense is also to refer to this sense. The sources of ‘proprioceptive’ or kinesthetic perception are presumably located in the joints, muscles, and tendons. The word kinesthesia or kinesthetic means - an inner neuromuscular feeling of an individual about the position of different body parts and how to move them by recalling the previous experiences (Gallahue, 1972).

Kinesthetic proprioceptors such as muscle spindles (stretch receptors) and golgi-tendon-organs (GTOs) can also provide important information about performance to the performer.
The kinesthetic receptors are the joint receptors. They are of three kinds: (a) spray-type receptors, (b) pressure-type receptors, and (c) GTO-type receptors. These receptors send information directly to the brain about movement occurring in joints (Singer, 1968).

Kinesthetic feedback is another source of information about performance during growth and development. It is gathered by GTO, muscle spindles, and other joint receptors. An analyst might apprise an athlete to tell him how much knee flexion he used in the last trial and to focus on that sense in practice.

Empirical evidence has led most physical educators to the conclusion that kinesthetic perception and muscular feeling is highly important for learning skills.

Practice can improve kinesthetic perception as well as the acuity of all the senses. For instance, when an individual in blindfolded state and practices a skill such as the golf swing, he/she relies more on kinesthetic cues and may improve this sense (Singer, 1968).

Balance is an important aspect of kinesthesis. Balance ability is determined to a great extent by proprioceptive activity, and tests of balance are recommended to be included in any battery of kinesthetic tests (Singer, 1968).

Information concerning the kinesthetic sense seems more limited than that regarding the other senses. A leading reason for this circumstance is the great difficulty researchers experienced in isolating this sense for study. In spite of the difficulties in obtaining precision in experimentation those receptors responsible for informing the body of its conscious change in position as well as of the relationship of its parts in space have been demonstrated to-be necessary for the smooth movements of the skilled act. Probably this sense they most by persons having visual limitation, for it is this sense they must rely on in order to perform motor skills adequately. Nevertheless, kinesthesia is a sense usually associated with the more gifted performers, and research appears to indicate its greater presence in those people demonstrating outstanding skills in motor activities.
Kinesthetic perception is important to motor learning. One must translate ideas into muscular action and get the feeling to learn motor skill. Motor learning is perceptual, cognitive, rational, and thoughtful and it involves mental as well as physical aspects of learning that is characterized to improve in general population during their growth and development period.

At the perceptual level the collections of kinesthetic sensory data from throughout the body are integrated into distinct kinesthetic perceptual system of a) sense of balance and equilibrium, b) sense of self-motion, c) sense of limb position, d) sense of limb movement, and e) sense of force (Longstaff, 2003).

1.2 Rural and Urban Concept

Urban and Rural Areas: According to census, urban area includes all municipal towns, cantonments and any other areas being administered by local bodies such as town committees, union committees, etc. It may also include any other place which satisfies the following empirical tests, to mention – (a) a population of at least ten thousand (10,000), (b) a density of at least 2000 person per square mile, (c) a minimum of three fourths of its working force does not have agricultural occupation, and (d) the place should have new pronounced urban characteristics and amenities like location of educational, medical on public institutions, offices or trading centers in it (Souxa, 1987).

Rural society as compared with urban society is marked by a relative predominance of agricultural occupation, the closeness of the people to a natural as contested with a human environment, the smallness of its communal aggregates, relatively spare population, greater social homogeneity, less internal differentiation and stratification and less territorial occupation and vertical social mobility of the population. The individuals in rural society as a rule have a few contacts with others. The associates are the people from a smaller geographic and social area. A greater proportion of his social contact and his relationship with any particular individual tend to have a longer duration (Seligman, 1959).
Rural-Urban Dichotomy

Rural and urban are relative terms having varied meanings in relation to the types of population and modes of life of people of a settlement. Censuses of various countries use these terms according to their own conveniences and density patterns. In short, urban settlements are nodal in character having centers of secondary tertiary activities and production. Moreover, they perform functions of a political educational, social, and religious character. Rural settlements on the other hand are chiefly concerned with primary production, be it agriculture, fishery, mining, forestry, etc. (Singh, 1990).

Difference in Rural and Urban Settings

Social life in the countryside moves and develops in a rural setting just as social life in the urban area moves and develops in an urban setting. The following are the most important criteria which distinguish the rural social world from the urban social world: a) Occupational difference, b) Environmental difference, c) Difference in the size of the communities, d) Difference in the density of the population, e) Difference in the homogeneity and heterogeneity of the population, f) Difference in the social mobility, g) Difference in the direction of migration, h) Difference in the social differentiation and stratification, and i) Difference in the system of social interaction (Nayek, 2005).

1.3 Growth Pattern

Although ‘growth pattern’ is largely determined by genetics factors, environmental factors help to determine whether someone reaches these limits. The term growth refers merely increase in size in terms of height, weight and also to the parts of the body. Growth means only physical change which can be seen with the eyes. Factors such as nutrition, physical activity, illness and lifestyle play significant roles in the process of physical growth (Gallahue, 2003).

1.3.1 Growth Characteristics

The speed of physical growth is rapid in the months after birth, and then it slows; birth weight is doubled in the first four months, tripled by age 12 months,
but not quadrupled until 24 months. Growth then proceeds at a slow rate until shortly before puberty (between about 9-15 years), when a period of rapid growth occurs. Growth is not uniform in rate and timing across all body parts. At birth, head size is already relatively near to that of an adult, but the lower parts of the body are much smaller than adult size. In the course of development, then, the head grows relatively little, and torso and limbs undergo a great deal of growth.

1.3.2 Mechanism of Growth

Genetic factors play a major role in determining the growth rate, and particularly the changes in proportion characteristic of early human development. However, genetic factors can produce the maximum growth only if environmental conditions are adequate. Poor nutrition and frequent injury and disease can reduce the individual’s adult stature, but the best environment cannot cause growth to a greater stature than is determined by heredity.

1.4 Motor Development

Motor means movement or motion. Development in movement efficiency is influenced by endowment factors and environmental factors. Both kinds of factors are having relative roles in the process.

1.4.1 Pattern of Motor Development

The speed of motor development is rapid in early life, as many of the reflexes of the newborn alter or disappear within the first year, and slow later. Like physical growth, motor development shows predictable patterns of cephalo-caudal (head to foot) and proximo-distal (torso to extremities) development. There are executive functions of the brain (working memory, timing measure of inhibition and switching) which are important to motor skills. The chronically ill children may affect one’s functional capabilities. The complexity of motor development process may be affected. But it can be improved by a trained person (Gallahue, 2003).

Normal individual differences in motor ability are common and depend in part on the child’s weight and build. However, after the infant period, normal
individual differences are strongly affected by opportunities to practice, observe, and be instructed on specific movements.

Cultural differences may encourage motor skills like using the left hand only for sanitary purposes and the right hand for all other uses. Cultural factors help to improved voluntary movements such as the use of the foot to dribble a football or the hand to dribble a basketball.

With any skill, to develop it, one needs to explore it, to experience it, to practice it. Every single thing children do is building their understanding and their abilities. From day one we need to be providing as many experiences and as much freedom as we can to provide children with the opportunities to manipulate their needs, to find the limits, to increase the ability, to determine what movement the situation calls for and how to make it happen (Wikipedia, 9.02.2011).

1.4.2 Mechanism of Motor Development

The mechanism in motor development involved some genetic component that determine the physical size of body parts at a given age, as well as aspects of muscle and bone strength. The main parts of the brain as frontal cortex, parietal cortex and basal ganglia were involved motor skills functioning. The frontal cortex for strategic processing, the parietal cortex for controlling perceptual-motor integration and basal-ganglia for motor sequences were responsible. The hind portion of the frontal lobe were responsible for ‘portional development’ (i.e., from back to front).

The motivation, practice and learning environment were the important role in skilled voluntary movements such as passing objects from hand to hand develops which according to Piaget’s developmental theory is extremely important in early childhood rule.
1.5 Cognitive Development

Four types of socio-demographic factors were classified for influencing cognitive development.

(i) Child level factors as birth weight, gender, developmental difficulties had lower cognitive ability scores.

(ii) Mother level factors as age at birth and educational level.

(iii) Household level factors as number of children in household, equivalised income and family and employment type.

(iv) Area level deprivation as individual or household circumstances.

Cognitive development is known to follow certain mechanisms; those are-

(i) Genetic and biological mechanisms were involved in cognitive development such as causes of mental retardation.

(ii) The factors food and nutrition, responsiveness of parents, daily experiences, physical activity and love can influence early brain development of children.

(iii) It is assumed that brain functions cause cognitive events. Developmental advances in cognition are also related to experience and learning.

There are normal individual differences in the ages at which specific cognitive abilities are achieved. There are few population differences in cognitive development. Boys and girls show some differences in their skills and preferences, but there is a great deal of overlap between the groups. Differences in cognitive achievement of different ethnic groups appear to result from cultural or other environmental factors (Wikipedia, 09.02.2011).

1.6 Rationale of the Study

Similar studies have been conducted on this age group to observe their growth pattern and motor ability as well as cognitive function on the same
population. However, this study is unique and exceptional in the sense that a systematic sampling technique had followed in this study to obtained more accurate result in the one hand and cognitive ability measured through CRT and perceptual ability of the particular age group was the criterion measure of the study on the other hand. Therefore, this study was something different from the studies of the other researchers.

1.7 Statement of the Problem

With this background concept the major purpose of the study was to analyse the growth pattern, motor ability and cognitive ability of rural and urban children of age between ten to twelve years.

Thus, the problem was stated as “A Comparative Study on Urban and Rural Children in Respect of Growth Pattern, Motor and Cognitive Development.”

1.8 Purpose of the Study

The purpose of the study is presented below according to the three dimensions of the study.

1.8.1 On Growth Pattern

i) To compare growth pattern of the children according to their age.

ii) To compare growth pattern of male and female children of same age.

iii) To compare growth pattern according to subjects’ residence at rural and urban localities.

1.8.2 On Motor Ability

i) To compare motor ability of the children according to their age.

ii) To compare motor ability of male and female children of same age.

iii) To compare motor ability according to subjects’ residence at rural and urban localities.
1.8.3 On Cognitive Ability

i) To compare cognitive ability of the children according to their age.

ii) To compare cognitive ability of male and female children of same age.

iii) To compare cognitive ability according to subjects’ residence at rural and urban localities.

1.9 Significance of the Study

The study findings will certainly act as a treasure of knowledge on growth pattern, motor and cognitive ability of the children, which will definitely -

1. Contribute to potential information on growth as well as motor and cognitive development characteristics during late childhood.

2. Contribute as a handful of information in the three areas of the study on particular age group with gender and locality variations.

3. Provide authentic information in relation to the rate of progress in growth pattern variables of the study.

4. Provide authentic information in relation to the rate of progress in motor ability variables of the study.

5. Provide authentic information in relation to the rate of progress in cognitive ability variables of the study.

1.10 Delimitation of the Study

These are the boundaries of the study. The number of the subjects, sex, age, the variable, included etc. should be specified even the area and the period also must be mentioned. For a scientific and systematic investigation the researcher has been compelled to delimit the study under the following conditions:

1. The present study was a cross sectional one.

2. The subjects of the present study were selected from rural and urban areas of West Bengal. The rural subjects were selected from Nadia, 24 Parganas
(South) and the urban subjects were selected from Kolkata, Howrah of West Bengal.

3. The subjects were 10, 11 and 12 years children. Children of lower age were not considered in the study.

4. Growth pattern was measured only by height, weight and BMI variables.

5. Moor ability was measured by speed, agility, power, co-ordination, balance and reaction time (simple) only.

6. Cognitive ability was measured only by CRT and Kinesthetic perception.

1.11 Limitations of the Study

Limitations are the conditions and factors beyond the control of the researcher. The study was conducted under the following limited conditions:

1. The researcher could not take the test on a particular date; even the testing time was different on various days.

2. The socio-economic status of the subjects was not considered in this study.

3. During administration of the tests, motivation, interest and attitudes of the subjects were also the limiting factors.

4. Due to paucity of time the sample size was confined to 600 only, and the subjects were taken from the four district of West Bengal.

5. The date of birth of the subjects was collected from the admission register of the schools. So, actual age of the subject could not be verified from other sources.

1.12 Definition and Explanation of the Terms

1.12.1 Growth Pattern

The term growth refers merely increase in size, and it applies not only to overall dimensions of the body in terms of height and weight but also to be parts of the body, as for example, the arms, trunk, head, brain, skeleton, muscles etc.
Growth patterns are generally controlled by genetic makeup at birth. All youngsters follow a general growth pattern; however, each child’s timing is unique. Some children are advanced physically for their chronological age, whereas others are slow matures. Only when aberration from the norm is excessive is there cause for concern. We know youngsters are maturing normally. When heights and weights are plotted on a graph from year to year, a distance curve can be developed. There curves give and indication of how tall and heavy children are expected to be during a specific year of life. Another way to examine growth patterns is to look at a velocity curve. The velocity curve reveals how much a child grows on a year-to-year basis. Children go through a rapid period of growth from birth to age. From age 6 to the onset of adolescence growth slows to a steady but increasing pattern. A general rule of thumb in regard to motor learning is that when growth is rapid the ability to learn new skill decrease. Because the rate of growth slows during the elementary school years this is an excellent window for learning motor skills.

**Various stages of growth and development**

Various psychologists believe that infancy, childhood, adolescence and adulthood are four stages through which every human being passes. The transition from one to the next is gradual and not immediate or sudden. According to Chauhan (1983) the major stages of development are – infancy (Birth to 2 years), early childhood (2 to 5 years), later childhood (6 to 12 years), adolescence (12 to 19 years) and Adulthood (Above 19 years) (Sharma, 2000).

**1.12.2 Motor Development**

A motor is a device which converts fluid power into mechanical force and motion. In short, a machine supplying energy called ‘motor’.

Development is the continuous process of change over time-beginning at conception and ceasing only at death (Gallahue, 2003). The term development refers the changes in the shape of the part of the body and the integration of various parts of the body into functional units as growth goes on Development can be only observed, whereas growth can be measured. It consists of progressive
series of changes of an orderly, coherent type towards the goal of maturity. In another way, development means a) the act of developing, b) the state of being developed, and c) a significance event, occurrence or change.

Motor development, may be viewed as progressive change in movement behavior throughout the life cycle. Motor development involves continuous adaptation to changes in one’s movement capabilities in the continual effort to achieve and maintain motor control and movement competence (Gallahue, 2003).

**Motor Ability**

The term ‘ability’ is defined as “a fairly enduring trait or characteristics”. Motor ability refers to enduring traits or characteristics that affect an individual’s effectors or output qualities.

Motor ability is define as the potential an individual has for motor performance, and as Morris and Whiting (1971) maintain, could place limits or later skill proficiency. Motor ability develops naturally and children have to work at developing physical abilities (Terry et al., 1989). ‘Motor ability’ refers to a person’s performance abilities as affected by the factors of speed, agility, power, co-ordination, balance and reaction time (Gallahue, 2006).

**Motor Skill**

Skills that are learnt over and over again are more likely to be recalled for a longer period. Motor skills development increases a) ability to move in variety of ways, (b) Ability to control ones body, (c) Ability to think, problem solve (d) Ability to assess and plan. There are men three types of motor skill that are: (a) Gross motor skills, where needs co-ordination and balance, i.e.. running, jumping, skipping, ball games and climbing. (b) Fine motor skills are the co-ordination of small muscle movements especially the co-ordination of finger movement with vision, such as writing, drawing, printing, block building and cutting etc., (c) Graphomotor is similar to fine motor skills but focuses on writing skill. Graphomotor skills not only involve the flexibility of the finger muscles but, also
the ability to keep up with the flow of ideas (Wikipedia, the free encyclopedia, 9.02.2011).

**Motor Performance**

Motor performance is a relatively short-term aspect of movement behavior that is a goal-centered, purposeful, observable movement behavior of relatively short duration and is the way in which an individual performs a specific skill (Cratty, 1967).

The term motor when used with the term performance implies an efferent action, a physical action, or an action requiring the use of large muscle groups. Performance can be temporary in nature, and the term motor performance refers to an effecter action which may not be permanently “fixed” in an individual’s movement repertoire.

**Motor Ability Components**

Motor-ability are refers to the ability of an individual to perform successfully in different factors of movement. Motor ability components include speed, agility, power, co-ordination, balance, and reaction time (Pangrazi, 2001).

**Speed:** It is the ability of the body to perform movement quickly and effectively in short period of time. For example, speed that we can see in all running events, and climbing, playing tag etc.

**Agility:** It is the ability to change direction of the entire body quickly and with accuracy while moving from one point to another such as football, hockey, wrestling etc.

**Power:** It is the ability to perform one maximum effort in as short time as possible. It referred sometimes as power = strength x speed. For example, striking, jumping, throwing for distance etc.

**Co-ordination:** It is the ability of the body to perform smoothly and successfully more than one motor task at the same time. It required mainly hand-eye, foot-eye skills. For example: catching a ball, kicking a ball, walking upstairs, tracking, etc.
Balance: It refers to the body’s ability to maintain a state of equilibrium while remaining stationary or moving. For examples, gymnastics activities and all movements required to essential maintaining balance.

Reaction Time: It is the elapsed interval of time from the presentation of a stimulus to the initiation of a response. It is generally considered to innate property. Example of reaction time is – starting in sprint events etc.

Fundamental Motor Skill: These types of skills are sometimes labeled basic or functional skills because the skills are necessary for children to function effectively in the environment. The five motor skill categories are- Locomotors Skill, Non-locomotors Skill, Manipulative Skill, Specialized Motor Skill and Body Management Skill (Pangrazi, 2001).

1.12.3 Cognitive Development

‘Cognitive’ comes from the Latin ‘to know’ or ‘to get knowledge of’ the act on process of knowing on perceiving is called cognition. Webster’s Dictionary defines the term as ‘the psychological result of perception and learning and reasoning’, which again gives a good impression of the topic of study. According to cognitive psychologists it is the study of human thought processes as information processing.

“Cognitive development” is the construction of thought processes including remembering, problem–solving, and decision–making, from childhood through adolescence to adulthood.

Cognitive Ability: Cognitive ability is the capacity to perform higher mental processes of reasoning, remembering, understanding and problem solving (college.cengase.com/psychology, 02.12.2013).

Kinesthesia: The term ‘kinesthesia’ was first used by Bastion (1880) reported by Recardson and Tandy (1973) to describe this “feeling of motion”. Kinesthesia has been defined as the cognizance of bodily position and movements, i.e. the sense of muscular effort (Young, 2013). Kinesthesia also referred to as kinesthetic
perception has been given many global definitions and meanings. It was labeled as “position sense” (Wells, 1960), “movement sensation” (Cratty, 1964), “the sense of movement” (Chncider & Tarshis, 1975), “conscious muscular movement” (Singer, 1985), “the perception of movement” (Clarke & Clarke, 1984).

**Kinesthetic Memory:** It is the ability to accurately duplicate a movement or position. Kinesthetic memory refers to the period of retention of specific movements, and is depended on the efficiency of the perception of kinesthetic cues (Ashby, 1983).

**Cognitive Concept of Learning:** Movement can be used to enhance the understanding and application of cognitive and academic learning. With regard to movement, concept learning is a permanent change in one’s motor behavior brought about by experiences designed to foster understanding of the movement concepts, skill concepts, fitness concepts, and activity concepts of the developmental physical education program. Cognitive learning can, and does, occur in the gymnasium and on the playing field. There are many reasons why cognitive concept learning can be effectively taught through movement. One reason is that active participation is fun. Movement often meets the needs and interests of children more fully than classroom activities that are less active. When a child is actively participating in a game that is teaching academic concepts, her attention is not easily diverted by extraneous stimuli (Gallahue, 2003).

**Components of cognitive concept learning (Gallahue, 2003):**

The researcher summarizes about components of cognitive concept learning which were relate to movement as follows:

![Components of cognitive concept learning](image-url)
**Skill Concepts:** How the body should move during to fundamental movements and specialized movements.

**Activity Concepts:** Knowledge of where the body should move in relating patterns, formations, rules and strategies.

**Academic Concepts:** Knowledge reinforced through movement in regard to language arts, Mathematics, science and social studies.

**Movement Concepts:** How the body can move related to effort awareness, space awareness and relationship awareness.

**Fitness Concepts:** Knowledge of how the body functions according to training principles, anatomical terms, physiological principles and nutritional information.

**Kinesthetic Perception**

‘Kinesthetic perception, is the ability to perceive the position and movement of the body and its joints during muscular action, is often referred to as the’ kinesthetic perception is important to motor learning (Singer, 1968).

The terms ‘Kinesthetic perception’ has an important role to predict cognitive level of an individual. The word ‘Kinesthetic’ means an inner neuromuscular feeling of the body parts is found and how to move them by recalling previous experiences (Gallahue, 1972).

Kinesthesia is a consciousness of muscular movement and effort and a keenly developed sense required of beginners and experts alike for proficiency in many motor skills.

The terms kinesthetic and proprioceptive generally refer to the same sense—providing information concerning the body’s position in space and the relationship of its parts (Singer, 1968).