Chapter I

INTRODUCTION

The needs of primitive men were basic and culture was simple relative to their requirements. Then, the ability to hunt and fight with the enemy was essential for his survival. The learning of such skills was a part of his education and the development of body. Though physical work was essential for survival, the need to develop strong and enduring bodies has been recognized through the ages, as vital for effective learning.

It is believed that human beings are meant for some purpose. They are responsible for some specific tasks, like enhancing the status of their nation, contributing for mankind etc., To perform his duties one must be physically, mentally, socially and spiritually sound. Any physical or mental lacuna is a great setback for them and they get isolated in this over populated world. Education and proper training can help them to overcome many of these problems.

The new born infant is helpless and unaware of the complex society and difficult living conditions. As he grows older, he is
influenced by the informal and formal agencies of education. Education cultures the individual and helps him to allocate his position in the society. In this sense, education is that conducive process which drags a person from darkness, poverty and misery by developing his individuality in all its aspects—physical, mental, social and emotional.

According to Raymont (1952) “Education is that process of development which consists the passage of human being from infancy to maturity, the process whereby he adapts himself gradually in various ways to his physical and spiritual environment”.

“Bucher (1960) stated that education must be concerned with developing optimum organic health, vital capacity, emotional stability, social consciousness, knowledge, wholesome attitudes and spiritual and moral qualities. The term ‘education’ aims at training the whole personality by means of guided participation. In this respect this term attains a physical significance and hence physical education has become a co-curricular activity. Physical education endeavours to effect and modify positively the development of person ability through the medium of physical activity”.
The physical education programme today is the product of long historical evolution. For his existence man developed certain patterns of movements which enabled him to survive the multiple hazards of his environment. Human beings are competitive by nature and they aspire for excellence in every aspect of life. This excellence is based on the solid foundation of good education and sound health.

Clarke (1957), pointed out that physical education is one phase of total education process and that it utilizes activity drives that are inherent in each individual. To develop a person organically, neuro-muscularly and emotionally, these outcomes are realised when ever physical education activities are conducted in places such as playground, gymnasium and swimming pool.

It is human tendency to be complete and rhythmic. Movement creates a sense of well-being. Besides creating pleasure, movement and communication are specific type of activities that helps to sustain agility and alertness, besides exerting a deep social and psychological influence. Any exercise or activity, in the long run, would produce some physiological adaptations in the body. Moreover, exercise
increases the capacity for more exercise by stimulating morphological, physiological and behavioural changes in the organism.

According to William, J.F. (1964), the organic systems of primary concern are the skeletal muscles, the heart, lungs, circulatory system, respiratory system and sense organs. The total interdependence of organic systems is based upon the anatomy and physiology of an individual. Physically, fitness is a by-product of training and gradual or graded exercises are best to promote physical activities. Regular stimulations of the total body through exercises increase energy and vitality, besides promoting the numerous variables associated with good health and physical fitness. Physical fitness is not an end in itself but a means to an end. It provides the basic optional physiological health and capacity to enjoy a full life.

There is a pronounced plasticity and adaptability in structural and functional properties of cells, tissues and organ systems in the human body, when exposed to various stimuli. While there is unanimous agreement that regular exercise is essential for optimal function of the human body. It is evident that extrinsic factors, such as diet and exercise, are reflected in the morbidity and flexibility
statistics, especially in the handicapped. Handicap word often is
associated with reduced physical fitness. As a consequence of
diminished or without exercise tolerance, a large and increasing
number of physically and mentally handicapped persons live ‘below’
or ‘at’ or just above the threshold of their physical ability, and are very
much dependent on others. Gradual physical training can readily
produce a profound improvement of functions essential for physical
fitness in physically handicapped. Gradual but regular exercise
enhances the work capacity and performance.

According to Getchell (1976) the primary adaptation of exercise
improve delivery of oxygen to the muscles. Training increase blood
volume and raises the level of oxygen carrying haemoglobin. The heart
becomes capable of pumping greater amount of blood with each beat
and this result in fewer heart beats being needed to circulate the given
amount of blood. Unlike the handicapped or physically unfit person,
highly trained endurance athletes typically have resting heart rates as
low as 30 to 40 beats per minute, but maximal heart rate does not
change.
The improved delivery and use of oxygen results in increased energy production, which in turn supports muscular contractions for better endurance performance. And increased lung volume, enhanced movement of oxygen from the lungs into the blood, and the ability to breathe more air per minute also occur with training.

Effects of exercise on the respiratory system also cause improvement in neuromuscular functions which make oxygen consumption and carbon-dioxide production decrease progressively for the same work to a minimum level as the gradual training progresses. As a result the pulmonary ventilation becomes more efficient and respiratory rate decreases. Thus the amount of oxygen needed by the respiratory muscles becomes less. These muscles improve their efficiency during training changes in pulmonary ventilation are associated with a decrease in rate and an increase in depth of respiration. For the trained subjects, even at rest the depth of breathing is greater and the respiratory rate gets reduced. So by gradual exercise programme slowly the heart rate is considerably reduced.

Gradual or graded exercise also has even been shown to be useful in lowering resting blood pressure among those with
hypertension, the lungs of well conditioned individuals can hold more air and such people need fewer breathes to sustain a given level of activity. Thus the conditioned heart can get more oxygen rich blood with less effort. Vigorous exercise thus enables people to sustain intense activity for longer periods. They get less fatigued from such activity and they recover more quickly from extreme exertion.

There are individuals who learn very fast. Some others who do not learn very fast but, with reasonable teaching learning input, can learn prescribed tasks, may be over a relatively longer time segment. There are some individuals who find it difficult to learn without special inputs. These are the individuals who have special learning needs which arise out of sensory, intellectual, psychological or even socio-cultural deficits. For example, persons with visual, hearing or other impairment have learning problems. So have persons with a low level of intellectual functioning and those with disorders in psychological processes. These conditions, impairments or disabilities impede the normal development of individuals – intellectually, socially, emotionally and physically. Needless to say the discrepancy in their development and the development of those without such impairment depends on the type and degree of the disability. There are, however,
ways to reduce this discrepancy through restorative, habilitative and rehabilitative inputs, including education. Thanks to significant developments in medical science, technology and education, the lives of disabled persons can be normalized through special inputs. These persons can also be educated using special instructional methodology and instructional material, and learning aids and equipments specific to special learning needs. It also requires additional teaching competencies in the teacher, in case of deaf and dumb children, special teachers are indispensable. This is, therefore, that component of education which employs special instructional methodology, instructional materials, learning teaching aids and equipment, and special teaching and managerial competencies to meet educational needs of persons with specific disability or disabilities like in this case the deaf and dumb children. These needs may be congenital or may arise out of conditions appearing at any stage of life.

According to A.K. Sinha (2005) "the projected population in 2016 according to 2001 census in India will be 1,263,543,000. The number of persons with disabilities in the country is estimated to be 18.49 million and this is 1.8 percent of the total approximate population. 10% of the persons with disability are likely to have
hearing impairment. However this number is likely to increase if we have to add hearing impairment of any degree. Attempts to collect information on the number of physically handicapped was made in 1959. At the request of the Ministry of Social Justice and Empowerment, Government of India, the third survey on the disabled was carried out in the 58th round during July-December, 2002. Along with the particulars of physical and mental disabilities, the socio-economic characteristics of the disabled persons such as their age, literacy, vocational training, employment, causes of disability, age at onset of disability were collected.

There are many types of disabilities but their social and psychological problem are similar in one way or the other. The basic point is communication of feelings to the society. The basic needs of a handicapped child in any society are not different from those of normal children. He wants his recognition in the society and acceptance from his fellow students in the school. This acceptance reassures security, which is though a mental a psychological aspect. Education and physical training are best mean for a handicap to develop his capacities and potentialities and to become an useful member of the society.
There are many psychological problems faced by a deaf person. The basic problem arises due to lack of communication with the society. He is unaware of that knowledge which he had it instantly with his ears. The deaf person's unawareness of the sound also causes another defect in him i.e. dumbness or muteness. Without two of the vital communication means, frustration creeps in them and become more and more rigid day by day.

Leon, F. (1957), Frustration causes various mental and physiological problems and affects the body capacities of deaf and dumb persons.

Frustration occurs when a motivated drive is blocked. The barrier may be either overt or covert. Here overt means outward or physical and covert means inward or mental-socio-psychological. In handicapped persons both type of frustration eventually comes. Frustration in handicap person triggers defense mechanisms. Traditionally, psychologists felt that frustration always led to the defense mechanism of aggression. It was thought that, on becoming frustrated, a person reacts by physically or symbolically attacking the barrier.
According to Myers, (1990) more recently, aggression has come to be viewed as only one possible reaction. Frustration may lead to any of the defense mechanisms used by the human organism. In handicap person, frustration may lead to any of the defense mechanisms; they can be grouped according to four broad categories.

1. Aggression

2. Withdrawal

3. Fixation

As Alan, C.F., Steven K. (1976), analyzed frustration in many of the complex behavior of human being. A minority person who comes from a disadvantaged educational and economical background or he is physically disadvantaged, but who still has intense needs for pride and dignity. One of the goal that may fulfill such individual’s needs is meaningful employment and proper allocation in the society. The handicap individual who meets barriers such as sympathy, prejudice, discrimination, lack of education and non-qualification, may become frustrated.

As per Rathus, S.A. (1990), possible reactions to this frustration may be aggression (riot or hate), withdrawal (apathy and unemployment) fixation (pretending the barriers do not exist and continuing to search unsuccessfully for a good job), or compromise (finding expression of pride and dignity in something other than a good job, such as in an anti-social gang or activity).

Due to such persons in many institutions behavioural reactions to frustration may occur. This has a negative impact on the individuals performance and on the institution, too. Some of this frustration may actually be translated into real costs to the institution.
Similar to the normal human being there are four basic sources responsible for conflict and inferiority complex in the handicap.

1. **Personal Differences:**

   Everyone has a unique background because of his or her upbringing, cultural and family traditions and of course for disabled person, the socialization process. This difference often become highly emotional. Disabled person even in the same family has different experiences and values as for normal human being.

2. **Information Deficiency:**

   This is due to communication breakdown and for deaf and dumb people it is obvious. Lack of information or misunderstanding the information (which often becomes misinformation) is quite common in such disability.

3. **Role Incompatibility:**

   Today the demand of the world in every aspect is inter-functional and one has to perform various tasks that are independent. Thus the roles of the individuals may be
incompatible. For disabled person this incompatibility becomes more serious.

4. Environmental Stress:

Stressful environment amplifies the above factors. In environments characterized by scarce or shrinking emotions and bonds, competitive pressure or high degrees of uncertainty within the family all kinds of drawbacks and complexes are possible and probable.

One of the ways to analyze the confronting behavior of disabled persons is through these response categories:-

1. Forcing – Assertive and Uncooperative.

2. Accommodating – Unassertive and cooperative.

3. Avoiding – Uncooperative and Unassertive.


5. Collaborating – Cooperative and Assertive.

David, A.W. and Kim, S.C. (1991), stated that like the psychological problems resulting from stress, the behavioural problems
of deaf and dumb children are often not attributed to stress by family members and even by their teachers. This generate psychological and physical symptoms of stress, the behavioural problems can be controlled, more effectively managed, and even prevented by the individual and the institution.

There may be many coping strategies for stress of deaf and dumb, such as – discussions, goal setting, behaviour modification, group dynamics, communication skills, leadership styles, decision making skills, control techniques, management of change and other development techniques.

Generally speaking, however, there are two major approaches that deal with complexes and stress of the disabled person. First are the individual strategies, which tend to be more reactive in nature. That is, they tend to be ways to coping with stress that has already occurred. Some individual strategies such as physical exercise, can be both reactive and practice, but most are geared towards helping the disabled person. The idea behind these strategies is to remove existing or potential stressors and thus, like preventive medicine, prevent the onset of complexes and stress for the disabled person.
Today, for disabled persons, self-help remedies, techniques, do-it-yourself approaches and physical exercises of course for them it should be graded one, are being given much attention. Some individual coping strategies are:

- Physical Exercises
- Relaxation
- Behavioral Self-Control
- Cognitive Therapy
- Social Networking, etc.

By exercise at least we can remove or lesser the physiological problems of the deaf and dumb children. Exercises when graded is not a burden on them. It is also a good source of communicational bond with the deaf and dumb children. It increases the sportive tendencies in them. The positive attitude from this frustration peeps out of this poetry of S.S. Dutt.

Satya Swaroop Dutt (1988) has written the views of a handicap and his desire in a very touching way.
“I don’t want you to open the door for me.
Just make it wide enough for me to get through.
I know my braces causes you to stare.
I don’t like them either, but they help me to walk.
I may be deaf, but I am not dumb........
So please don’t call me that..............
I choose to talk with my hands
I used to play football, hunt and swim .......
Then I lost my legs ...... but I didn’t loose my desire
I don’t see the sunset.......don’t pity me.......
I have never seen it
Let me walk with you ........even it is with my hands.
If I had three wishes, I’d wish for happiness.
I’d probably wish to be whole and
I’d wish to be accepted to be what I am.”

According to Henry Webb (1981), disabled do not need pity but they need encouragement in their efforts to overcome their disabilities so that they become asset to the society in-lieu- of liability. They also have the right to grow-up in the world, which looks at them not with a scorn or pity but which welcomes them exactly as it welcomes
everyone, which offers them identical privilege and identical responsibilities.

Devoid of the basic needs, doesn’t means that they do not have feelings, like other human beings, they have imaginations, dreams and concepts for their life, too. Only thing important is that how their disability or disabilities are compensated by other means or their other senses are trained such that they come near to the perfection. Adapted Physical Education helps them in their functional development.

Now we will go through sub-discipline of physical education i.e., Adapted Physical Education.

It is an individualized programme created for students who require a specially designed programme for more than 30 days. The programme involves physical fitness, motor fitness, fundamental motor skills and patterns, aquatics skill, dance skills, individual & group games and sports (including life time sports). For people with disabilities, adapted physical education provides safe, personally satisfying and successful experiences related to physical activity, rather than a sedentary alternative programme. Adapted Physical Education is a direct service, not a related service. Students include people with
disabilities as specified in the Individuals with Disabilities Education Act (IDEA). This includes children who have mental retardation, deafness or other hearing impairment, speech or language impairment, blindness or other impairment, orthopedic impairment, autism, traumatic brain injury, or multiple disabilities that require special education or related services.

Infants and toddlers who need early intervention services because of developmental delays in cognitive, physical, social, communicational, emotional or adaptive development can also qualify. The students chosen should be those who are “at risk” for experiencing a developmental delay, if early intervention services are not provided.

Adapted Physical Education can be programmed in such a way that their inherent skills are incorporated along with the modern techniques. This programme can act as stairs not as creepers for the handicap person. For deaf and dumb with the sign language it can be easily administered.

In the society handicapped individuals are being identified as being:
➤ Mentally retarded,

➤ Emotionally disturbed,

➤ Deaf or hearing impaired,

➤ Dumb,

➤ Orthopedically impaired,

➤ Visually impaired or blind,

➤ Learning disabled,

➤ Multihandicapped or otherwise health impaired.

As an integrated part of education system physical education should bear responsibility of the rehabilitation of the handicapped through adaptive physical education and recreational activities. By means of physical activities, development such as - physical, mental, social and some specified personal skill, is possible. In this fast moving society disabled need to be educated and prepared for life with a reasonable level of economic in-dependence, self-help skills, and social normalization.
Many objectives of education such as objective of health, good use of leisure and character formation directly and objectives of citizenship, command of basic processes, worthy family membership and vocation are indirectly fulfilled by physical education.

For sound personality of any child, physical activity has its unique contribution. This contribution becomes more important in case of handicapped children. Learning through senses is natural way of acquiring knowledge and it is obvious that if any one of the senses is lacking, learning is hindered. Then it becomes compulsory for the remaining senses, to be trained and used effectively, to compensate the lacking one. It is seen that handicap willingly does not take part in plays and activities that contributes to fitness and physical development. Thus many desirable goals of education are not achieved.

Kane (1972) emphasized that physical education contributes to the physical, mental, emotional and social growth of children.

The first task should be taken to make the community sensitive to the needs of the handicapped children, in general, to their educational needs. The society had to leave it's so called sympathetic behavior and have to give all the natural and human right to the
handicap. The law should not only be formed but administered strictly for the right of the handicapped.

According to Auxter (1981), “The time has come when we no longer tolerate the neglect of handicapped; these people have the right to work, to the best of their ability to know the dignity, which every human being is entitled to. These people who can and must be helped to help themselves, that is their constitutional right which is clearly affirmed in number of recent court decisions.”

The word deaf is used differently in different contexts, and there is controversy over its meaning and implications. In scientific and medical terms, deafness generally refers to a physical condition characterized by lack of sensitivity to sound. Notated as deaf with a lowercase d, this refers to the audiological experience of someone who is partially or wholly lacking hearing.

In legal terms, deafness is defined by degree of hearing loss. These degrees include:

- Profound to total deafness (90dB – 120 dB)
- Severe (60 dB – 90 dB)
• Moderate (30 dB – 60 dB)

• Mild Deafness (0 dB – 30 dB)

Both severe and moderate deafness can be referred to as partial deafness while mild deafness is usually called hard of hearing.

Within the deaf community, the term “Deaf” is often capitalized when written, and it refers to a tight-knit cultural group of people whose primary language is signed, and who practice social and cultural norms which are distinct from those of the surrounding hearing community. This community does not automatically include all those who are clinically or legally deaf, nor does it exclude every hearing person.

**Dumb:** Dumbness or muteness is a speech disorder in which a person lacks the power of articulate speech.

In U.K., the term for muteness is ‘dumbness’, but due to the influence of American English using the word ‘dumb’ to refer to mute person can cause offence. Due to political correctness, the term speech-impairment is now preferred.
According to U. Shankar (1975), touch, sight and hearing are the three primary responses which an infant has, for his very first introduction to the world. It is only through hearing that the child acquires information and knowledge and get accustomed to the language of the outer world. He is able to know the happening within his immediate physical environment. Sound build in the minds of individuals, symbols for words and concepts on the basis of hearing, seeing and of course with other senses. Hearing also serves as a warning for any danger. The ears are like windows, open to the outer world to sense and judge the happenings and changes.

Hearing impairment is mostly accompanied by dumbness. Unlike other type of handicapped, they are not alert to their environment. They can see and feel but can’t explain the incident or happenings. Here various aids and education can help them to explain their inner self.

After survey one of the study presented in US Congress concerned with the deaf or hearing impaired. ‘Deaf” means a hearing impairment which is so severe that the child is impaired in processing
linguistic information through hearing, with or without amplification, which adversely affects his educational performance.

Deafness is one of the miserable disabilities of human being. It may be by birth or by any other cause such as small-pox etc. Whenever it starts with whatever degree, deafness affects the speech. Those children are affected most who are born deaf or become deaf before the advent of the speech. The speech of even those children who become profoundly deaf as late as 7-9 of the age, are also seriously affected. Even those who become deaf in later years of their life too experience difficulty in communicating with the hearing. This makes them weak psychologically and with despairment. As they lead their life into a silent world the feeling of isolation, frustration and depression haunts them with a sense of inferiority complex and even they tend towards self-destruction.

Two major problems that the deaf children face are:

- Gaining Education

- Integrating with the society of hearing peers.
Suffering from adjustment problems they often become introvert, so in educating deaf, physical education and recreation are indispensable. This can bring back the deaf into the natural environment from their silent world. Therefore the aim of the programme of physical education for the deaf should be:

"To develop through the medium of physical education and recreation, each hearing impaired individual, to his optimum effectiveness socially, physically, emotionally and intellectually strive, so that he could achieve wholesome personality and live successfully with both the deaf and the normal peers".

Though physical education doesn't treat normal and handicapped, differently, it has similar objectives for the duo. But loss of hearing is a great barrier to communicate with others and therefore it becomes a social handicap.

In developed countries like U.S.A., Germany, Britain, etc., various researches are being carried out to sort out the problem of communication. Various devices such as computers, robots, sophisticated hearing aids, G.P.R.S. system and various sensory alert apparatuses has been developed to assist this problem.
According to programme of Discovery channel "DOGS WITH JOBS" besides hiring human nurses and assistants they can have the services of trained 'hearing dogs'. By assistance of these dogs, the deaf and dumb people now can be well informed with -, door bells, telephone calls, fire alarms etc. and even they can walk or drive smoothly on the roads. They work as alert system or as an ear for the handicap. In India where the society and facilities are very much reserve for the normal human beings, these devices, aids, and assistance have to wait, to be incorporated in the near future. In such situation deaf and dumb people are to be made self dependent, confident and alert to face the situations that are to be faced and won.

By training these handicap people we can make them more self sufficient. Therefore, as regards to the deaf, this is an obvious need for special and compensatory attention to fulfill the objectives. Mind in class rooms and body in gymnasium and playgrounds can not be trained separately. When a deaf student enters a school, he has to be treated like a normal child and his personality should be served as a whole unit. This unit comprise of social, physical, emotional and intellectual aspects as they are co-related with one another.
Deafness limits the child's experience, therefore social, motor and psychological aspects of development becomes limited too. Physical education plays an important role in the training and education of the deaf. Some programmes of physical education can play prime role in the coordinated development of the child's personality i.e., in making him physically fit, mentally alert, emotionally sound and socially acceptable.

From the above view point, the researcher has tried to give physical/motor input, so that wholesome growth of such subject’s may be achieved.

**Statement of the problem**

There are some individuals who find it difficult to learn without special inputs and have special learning needs, which arise out of sensory, psychological and socio-cultural deficits. It also depends on the type and degree of the disability. There are, however ways to reduce this discrepancy through restorative, habilitative and rehabilitative inputs, including education and some types of physical activities/exercises.
The purpose of this study is to analyze the effects of graded exercise on selected physiological variables of deaf and dumb children.

**Delimitations**

1. The study was delimited to deaf and dumb male children only.

2. The study was also delimited to deaf and dumb children of age group 14-20 years.

3. The study was delimited to Kanpur city only.

4. The study was delimited to the following physiological variables.

   4.1 Resting Heart Rate

   4.2 Vital Capacity

   4.3 Haemoglobin Percentage

   4.4 Body Composition (Muscular girth at various sites)

      4.4.1 Triceps girth

      4.4.2 Suprailliac girth

      4.4.3 Subscapular girth
4.4.4 Abdominal Umbilicus girth

4.5 Breath Holding Capacity

4.5.1 Positive Breath Holding Capacity

4.5.2 Negative Breath Holding Capacity

4.6 Cardio Respiratory Endurance

5. The study was further delimited to twelve weeks of graded exercise session to be given, starting from very simple and slow movement and then slowly upgrading the intensity and other aspects of exercises. These exercises are:

5.1 Jumping Jacks (two counts)

5.2 Jumping Jacks (four counts)

5.3 Alternate Toe Touching

5.4 Sideways Lunging

5.5 Step Ups (30 seconds)

5.6 Shuttle Run (10×4)

5.7 50 Mts. Run
5.8 Bent Knee Sit-ups (15×3)

5.9 Forward Lungening

5.10 Trunk Rotation

5.11 Sideways bending

5.12 Sideways Twisting (upper body both side)

5.13 Shoulder Rotation

5.14 Forward & Backward Bending

5.15 Hala Aasana

5.16 Bhujang Aasana

**Limitations**

1. The children were from different socio economic status, different dietary habits, different mode of living and their difference in terms of interaction with the hearing peers, which could not be controlled by the researcher might have affected the performance was considered as one of the limitations.
2. All subjects of age group between 14-20 years were taken from single institution “Jyoti Badhir Vidyalaya, Bithor, Kanpur.”

3. The deaf and dumb children taken for the exercise programme were from different classes, which might have affected their performance.

**Hypothesis**

On the basis of literature reviewed, expert’s opinion and scholar’s own professional experience, it was hypothesized that twelve weeks of graded exercise programme will significantly produce changes regarding selected physiological components of deaf and dumb children.

**Definition and explanation of terms**

**Graded Exercise**

“A monitored ‘Self-developed gradual exercise programme’ to increase strength and cardiovascular has proven helpful to some patients.”
These activities have gradual but progressive increase in exercise or everyday activities, depending on the severity of the illness. The good graded exercise/activity starts and continue at a manageable and realistic pace. Such as walking is often chosen as an exercise and it could start at just a few paces, stability in activity is also encouraged to help to reduce the ups and downs.

Once the body has adapted to this activity, it is slightly more to allow a further increase in strength and fitness. It should be a very gradual process which takes into account any setbacks or relapses, making adjustment if necessary.

It is ensured that all practitioners understand the importance of starting the therapy at a level that is manageable for the individual, increasing gradually and always in agreement with the person being treated.

**Physiological Variables**

Physiological variables may be defined as those variables which are directly linked to various physiological systems and which may be voluntary or involuntary, such as Resting Heart Rate, Vital Capacity etc.
**Resting Heart Rate:**

Best and Taylor (1972) have stated that Resting Heart Rate is pressure change transmitted as a wave through the arterial wall and blood column to the periphery while the person is at rest.

**Vital Capacity:**

Clarke (1975) - Vital Capacity is defined as the largest volume of air that can be exhaled after deepest possible inhalation.

**Body Composition:**

The girth of the skinfold at Triceps, Suprailliac, Subscapular and Abdominal Umbilicus was considered for body composition.

**Haemoglobin:**

Fox and Mathews (1981) - It is a substance contained within the red blood cells and responsible for the colour. Composed of the pigment home (an iron containing porphyrin) linked to the protein globins. Haemoglobin has the unique property of combining reversibly with oxygen and is the medium through which oxygen is transported.
within the body. It takes up oxygen as blood passes through the lungs and releases it as blood passes through the tissues.

**Breath Holding Capacity:**

It is the duration of time, through which one can hold his breath without inhaling or exhaling. Breath holding could be positive or negative.

(a) **Positive Breath Holding Capacity**

When breath is held after forcefully inhaling the air, otherwise known as breath holding time after inhalation.

(b) **Negative Breath Holding Capacity**

When the breath is held after inhaling the air forcefully otherwise known as breath holding time after exhalation.

**Cardio-Respiratory System:**

Johnson & Nelson (1982) - The ability of all circulatory and respiratory systems to adjust to and recover from the effects of exercise or work.
Deaf:

Encyclopedia Britannica (1968)- The term deaf is frequently applied to those who are deficient in hearing any degree, however, slight, as well to the people who are unable to detect the loudest sound.

‘Deafness’ means hearing impairment which blocks the processing of linguistic information’s through hearing.

Dumb:

Marimam Webster Dictionary (1969) by nature incapable of any speech like that of a normal human being. If the speech is either totally absent or so defective (non-functional) for ordinary purpose of life. Unlike other human beings, when the child is, by nature, incapable of pronouncing any word or any types of speech are called dumb. Dumbness is always associated with the deafness problem.

Significance of the Study

Society, nation and the field of research expects from every study to contribute for them, and which value for them in their progress and future. As we know the objectives of physical education basically are same for handicapped and normal. In case of deaf and dumb, loss
of hearing impairs the ability to communicate effectively. Thus this physical disability rather turns into a social ailment.

In such case those objectives should be given priority which helps to develop the potentialities of hearing impaired to the optimum, so that they can effectively achieve a total personality, socially, physically, emotionally and intellectually. So that they can successfully co-exist with both deaf and hearing peers.

1. The present study will highlight how much significant a programme of physical education is, for bringing significant changes and effects of graded exercise on selected physiological variables of deaf and dumb children.

2. The results of the study will also be of great significance in identifying the areas which can be easily developed.

3. This study will serve as a guideline to physical education teachers.

4. The administration of physical education programme will help the teachers to realize the potentialities and innate qualities of
the child and thus helping the child to channelize his potentialities in proper manner or direction.

5. It may also help teachers other than the physical education teachers in realizing the benefits of deaf and dumb child, participating in physical education programme and thus encouraging them to participate more and more in physical activities.

6. This study may also help in framing physical education as an integral part of curriculum for deaf and dumb children.

7. The study may also help the physical educator to incorporate the method of graded exercise.

8. It will show the importance of graded exercises in the improvement of activities of the deaf and dumb children.