CHAPTER - III
METHODOLOGY

To verify hypothesis, the next sequential step is methodology. To conduct the study, the systematic and scientific method is to be used to find out the results. To solve the problem, following steps have been taken to conduct the study.

3.1 SAMPLE :-

“A random sample is one in which each element in the universe has an equal opportunity of being selected.” (Henry, J. Montaye, 1973)

Sampling is taking any portion of a population or universe as representative of that population or universe. It is rather taking a portion of population and considering it to be the representative.

Random sampling is the method of drawing a portion (sample) of a population or a universe so that all possible samples of fixed size “n” have the same probability of being selected. (W. Feller, 1957)

Definitions indicate that a sample taken for the study may be selected from any place of the given area, therefore, for the above mentioned study, random sampling method has been selected.

For the present study, 50 boys and 50 girls from age group i.e. 12, 13, 14 and 15 years respectively were selected from various schools of Chhattisgarh. While selecting the sample, special emphasis was placed on selection of left handed boys and girls. In this way, in all 400 adolescents (200 boys and 200 girls) was selected.
3.2 RESEARCH DESIGN :-

The scientific quality of the research findings depends on research design. It is also known as a blue print of research engineer which tells him what to do and what not to do while chalking out the steps to be taken in sequential manner for collecting, analysing the empirical data for the sake of verification of his research hypothesis.

Research methodologists like Kerlinger (1978), Edward (1968), Winer (1971) considered research design as a controlled mechanism governed by the principle of “Max con Min”. The ‘Max’ instruct the investigator to go for maximisation of systematic variance. The ‘Con’ segment of the principle asked him to control over unwanted variables and ‘Min’ part of this principle motivates him to minimise error variance so that it leads to sound generalisation.

Hence while selecting a suitable research design for the present investigation, the hypotheses was taken into the consideration. Therefore for verification of the relation oriented hypotheses stated in chapter-I, correlation design was considered. Contrasted group design and factorial group design used for verification of differential and interaction hypotheses.

3.3 NATURE OF THE VARIABLES :-

(a) Brain Hemisphere Dominance:

A cerebral hemisphere (hemispherium cerebrale) is defined as one of the two regions of the brain that are delineated by the body’s median plane. The brain can thus be described as being divided into left and right cerebral hemispheres. Each of these hemispheres has an outer layer of
grey matter called the cerebral cortex that is supported by an inner layer of white matter. The hemispheres are linked by the corpus callosum, a very large bundle of nerve fibers, and also by other smaller commissures, including the anterior commissure, posterior commissure, and hippocampal commissure. These commissures transfer information between the two hemispheres to coordinate localized functions. The architecture, types of cells, types of neurotransmitters and receptor subtypes are all distributed among the two hemispheres in a markedly asymmetric fashion. In the present study also, left, right and integrated brain hemisphere domination is determined and its effect upon motor educability has been analysed.

In the present study, brain hemisphere dominance i.e. left, right and integrated brain hemisphere dominance is taken as independent variable.

(b) Motor Learning / Educability

Motor learning is a process of acquiring, completing and using motor information, knowledge, experience, and motor programmes (Adams, 1976). It is closely connected with mental abilities, motor abilities, foreknowledge, the cognitive and connative characteristics of an individual as well as his familiarity with the theoretical bases of movement technique.

General motor abilities entails one’s present performance level - the efficiency with which a person executes motor skills. General motor capacity means an individual’s innate potentialities for performance in motor skills, the limit to which an individual may be developed. The
capability of an individual to learn new skills is termed as **general motor educability**. In the present study, the research design is mixed, hence motor educability acted as dependent variable but in two factor interaction it is acted as independent variable.

(c) **Intelligence**

“Intelligence is a property of mind that encompasses many related mental abilities, such as the capacities to reason, plan, solve problems, think abstractly, comprehend ideas and language, and learn.” (Wikipedia, 4 October, 2006)

“Intelligence is not a single, unitary ability, but rather a composite of several functions. The term denotes that combination of abilities required for survival and advancement within a particular culture.” (Anastasi, 1992)

E.L. Thorndike (1927) has divided intelligent activity into three types i.e. (1) Social intelligence, or ability to understand and deal with persons; (2) Concrete intelligence, or ability to understand and deal with things as in skilled trades and scientific appliances, (3) Abstract intelligence, or ability to understand and deal with verbal and mathematical symbols.

In the present study, mixed design is used for verification of hypotheses, hence while verifying differential hypotheses intelligence is used as dependent variable while for the purpose of interaction hypotheses it is acted as independent variable.
3.4 TOOLS :-

To conduct the study following tools were used.

(a) **Brain Hemisphere Domination Test**

To assess domination of left or right side of the brain, Brain Dominant Hemisphere Test (B.D.H.T.) i.e. *t Šíмëšą ì áåë è Zá v má q È́žòåù* prepared by **Agashe and Helode (2007)** was be used. This test is highly reliable and valid. (Appendix A)

(b) **Motor Educability Test :-**

To assess motor educability of adolescent boys and girls **Johnson’s test of motor educability (1932)** was used. It is useful for age group 11 to adulthood. The tests items are straddle jump, stagger skip, stagger jump, Forward skip holding opposite foot from behind, Front roll, Jumping half-turns, right or left, Back roll, jumping half turns, right and left alternately, Front and back roll combination, jumping full turns respectively. The test has a validity of .65.

(c) **Mixed Type Group Test of Intelligence (MGTI)**

To measure intelligence, **Malhotra’s (1984)** Mixed Type Group Test of Intelligence (MGTI) was used. This test has two parts i.e. verbal and non verbal intelligence test. Both the parts have 50 statements. The test-retest reliability of the verbal test is 0.89, for non verbal test it is 0.82 while full test reliability coefficient is 0.86. The validity verbal test is .86 and for non verbal test it is 0.72 while the overall validity of the test is 0.87 when it was correlated with teacher’s ratings. (Appendix B)
3.5 PROCEDURE :-

Selected boys and girls between age group 12 to 15 from various schools of Chhattisgarh state, were subjected to the aforementioned tools in a laboratory like condition. First of all the Brain Hemisphere Domination Test was administered to each subject and after sufficient rest the Mixed Type Group Test of Intelligence was administered to each subject as instructed given by the author.

The motor educability test of Johnson (1932) was administered to each subject as per their convenience during school hours.

The scoring was done as per the instruction manual provided with each test.

To find out the brain hemisphere dominance, i.e. left, right and integrated brain hemisphere dominance, the scores are divided by 12, as suggested by the authors of the manual. Percentile norms for these BHDT scores were obtained and the scores while fall below 25th percentile were considered as left dominant brain hemisphere while scores over 75th percentile were considered as right dominant brain hemisphere. The score between 25th and 75th percentile were considered as integrated brain hemisphere dominance. By this method brain hemisphere dominance of each subject was ascertained.

The scores on MGTI were scored off as per the scoring key provided with the manual while motor skill learning scores was obtained for each subjects by adding the scores on all the 10 test items.

After scoring, the data was arranged according to their respective groups and put to statistical treatment for verification of hypotheses.