From Rocks to Sand
Waves roll rocks and boulders backwards and forwards on the shore. The boulders break into pebbles and then into tiny grains of sand. This change takes hundreds or thousands of years.

Shifting Sands
Dunes are made of sand blown into low hills by the wind.

An estuary is the place where a river flows into the sea.

Sea cliffs are one of the best places to see the different layers of rock.

Living Rock
Coral is found in warm, sunny, shallow seas. It is made by tiny sea creatures that look like flowers. Over thousands of years, their skeletons build up into huge coral reefs and islands.

Waves can build sand, mud and pebbles into a long strip of new land. It is called a spit.

Chapter – IV

Methodology
### CHAPTER - IV

**METHODOLOGY**

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CHAPTER - IV
METHODOLOGY

"Research is the systematic and objective analysis and recording of controlled observations they may lead to the development of generalization of principles or theories resulting in Educational and possibly ultimate control of events"


Evolving a suitable methodology for a research project based on scientific procedure with a view to arriving at a successful solution to the problem chosen is indeed a difficult task. Hence much thought has to be bestowed on the plan and procedure to be followed in conducting a research. The success of any research depends upon the suitability of the method employed. Methodology is the description of procedure or techniques adopted in a research study or investigation. Methodology or the producers adopted in any research study occupies a very important place, as the success of any research depends largely upon the suitability of the method and the tool and techniques used for the collection of data. “The vehicle of research cannot perform its function without its sincere methodology which lays out the way in which formal research is to be carried out and outlines the detailed description of research variables and procedure”. The validity and reliability of the findings also depend upon the method adopted. Assurable method helps the researcher to explore the diverse strands of the study and adequately measure them so as to satisfy there requirements and thus it is the mean to end (Burr, 1960). This chapter describes the procedure adopted to conduct the investigation. The methodology for the present investigation is described under the following headings in this chapter.

➢ Rationale for the study
➢ Research questions
➢ Objectives of the research study
4.1 RATIONALE FOR THE STUDY

Today in most of the schools geography is taught and learnt by memorizing certain important questions without understanding. As a result students do not understand among different geography topics. Hence they forget everything as soon as they come out of examination hall, moreover many students get low marks and some students got poor marks in the examination. The first and the foremost reason for failure is due to the lack of the following.

- Proper understanding of the concepts in geography
- The geographical facts
- Methodology of teaching in geography
- Teaching perceptive and thinking skills to the learners
- Poor preparation of geography teachers.

The major task of professional preparation for geographic teacher is to develop a teaching style based on practice of strategies which help to develop competencies related to Perception and Thinking Skills in geography learning and teaching. Perceptive-Thinking Skills help students in the development of cognitive abilities which are influenced by many variables. Proper Perceptive and Thinking Skills play a vital role on enhancing geography achievement. When the student perceives the environment with auditory, visual, tactile, olfactory and coetaneous sensors help their mind register experiences in long term memory. Thus they
understand better the geography concepts. Through Perceptive Thinking Skills, one can better understand the content and achieve better results in the examination.

4.2 RESEARCH QUESTIONS

The current research poses the following questions and give a focus and definite direction to the research process.

1. How to make geography teaching interesting?
2. How to improve the thinking skills in learning geography?
3. How to improve the perceptive skills in learning geography?
4. What are the important Perceptive-Thinking Skills?
5. How to improve the Perceptive Thinking Skills of the Teacher Trainees?
6. What are the ways to enhance the geography achievement of the DIET trainees through Perceptive Thinking Skills?
7. Will teaching Perceptive Thinking Skills improve their Geography Achievement?
8. How to assess the Perceptive Thinking Skills among the DIET Teacher Trainees?
9. How to make the teacher trainees to apply various Perceptive Thinking Skills in teaching-learning geography?

4.3 OBJECTIVES OF THE RESEARCH STUDY

The research work has been undertaken to achieve the following objectives,

• To make geography teaching more interesting among DIET teacher trainees.
• To enhance geography achievement among DIET Teacher Trainees.
• To identify the principles of Perceptive-Thinking Skills which are helpful in enhancing the geography achievement
• To evolve a model to enhance the Perceptive Thinking Skills.
• To construct a tool to assess the Perceptive Thinking Skills among the teacher trainees.
• To construct a tool to assess the Geography Achievement.
• To enhance the Perceptive Thinking Skills among DIET Teacher Trainees using the evolved model.

• To identify the effect of Perceptive Thinking Skills among DIET Teacher Trainees in learning geography.

4.4 ASSUMPTIONS OF THE STUDY

• DIET Teacher Trainees can be given proper training to enhance Perceptive Thinking Skills.

• The interest of teacher trainees in learning geography can be enhanced.

• It is possible to enhance geography achievement among DIET Teacher trainees.

• The level of Perceptive Thinking Skills among DIET Teacher Trainees is low.

• The level of Perceptive Thinking Skills among DIET teacher trainees can be enhanced.

• It is possible to design and develop a model to enhance Perceptive-Thinking Skills.

• The perceptive-thinking skills will be helpful in enhancing to geography achievement.

4.5 HYPOTHESES

1. There is no significant difference between mean ranks of pre, progressive and post test in Perceptive - Thinking Skills.

2. There is no significant difference among the pre, progressive and post test of Perceptive - Thinking Skills.

3. There is no significant difference between male and female teacher trainees with respect to their gain scores in pre, progressive and post test in Perceptive - Thinking Skills.

4. There is no significant difference between rural and urban with respect to their gain scores of pre, progressive and post test in Perceptive - Thinking Skills.

5. There is no significant difference between teacher trainees who studied in government school and private school with respect to their gain scores of pre,
6. There is no significant difference between the gain scores of pre, progressive and post test in Perceptive - Thinking Skills with respect to the achievement level in higher secondary.

7. There is no significant difference between age group with respect to their gain scores of pre, progressive and post test in Perceptive - Thinking Skills.

8. There is no significant difference between different communities with respect to their gain scores of pre, progressive and post test in Perceptive - Thinking Skills.

9. There is no significant difference among various streams of teacher trainees with respect to their gain scores of pre, progressive and post test in Perceptive - Thinking Skills.

10. There is no significant relationship among the gain scores of pre, progressive and post test in Perceptive - Thinking Skills.

11. There is no significant difference between mean ranks of pre, progressive and post test in Geography achievement scores.

12. There is no significant difference between the gain scores of pre, progressive and post test in Geography achievement.

13. There is no significant difference between male and female teacher trainees with respect to their gain scores in pre, progressive and post test in Geography achievement.

14. There is no significant difference between rural and urban teacher trainees with respect to their gain scores of pre, progressive and post test in Geography achievement.

15. There is no significant difference between teacher trainees who studied in government school and private school with respect to their gain scores of pre, progressive and post test in Geography achievement.

16. There is no significant difference between the gain scores of Geography achievement in pre, progressive and post test.

17. There is no significant difference between age group of teacher trainees with
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respect to their gain scores of pre, progressive and post test in Geography achievement.

18. There is no significant difference between communities with respect to their gain scores of pre, progressive and post test in Geography achievement.

19. There is no significant difference among various streams of teacher trainees with respect to their gain scores of pre, progressive and post test in Geography achievement.

20. There is no significant difference between correlation coefficient in gain scores of Geography achievement.

4.6 TITLE OF THE PROBLEM

The title of the problem is stated as “Effect of Perceptive Thinking Skills on Enhancing Achievement in Geography among DIET Teacher Trainees”.

4.7 DEFINITION OF THE KEY TERMS

Effect: Effect is the result of any action or concept.

Perceptive: According to Webster dictionary the term perception is nothing but the apprehension of an object or situation affecting any or all of the sense organs by way of sensation (Marry Colines & James Dreven, 1949).

Perception is a process by which the individual understands and establish contacts with the outside environment (G.D. Boaz, 1956).

As the study of processes by which an organism becomes aware of or responds to the environment. (Donald.H.M.C Burney/Virginia .C. Collings, 1984).

And ability to perceive (perceive to become aware of with the mind or through one of the sense (The Hutchinson Encyclopedia Educational dictionary, 1999).

The faculty of the mind by which we gain knowledge through that sense, if the existence and properties of mater (World University Encyclopedia Educational Vol II, 1996).

Perception is the process where by sensory stimulation is translated into organized or meaningful experience (Encyclopedia Educational Britannica, 1990).

The awareness of the external world or some aspect of it through physical
sensation and the interpretation of these by the mind (Readers Digest Great Illustrated Dictionary, 2001).

**Perception:** The faculty of an individual resulting in accurate deflection of significant or desired aspects of external reality there the senses, a oriental image or observation of those detected there the sense, a mental image or observation of external reality detected three the senses an in sight or intuition.

**Thinking:** is recalling the past auditory, visual, cetaceous, olfactory and kinesthetic experiences and reflecting over it.

**Skill:** Skill of an individual is defined as a specialized ability or capacity over a particular task, a well developed capability of any kind, including intellectual physical or artistic capabilities.

**Enhancing:** An improvised / betterment state of an action, quality or skill than the previous one.

**Geography:** Geography is dealing with human kind, environment and interactions between both living in accordance with nature, the three spheres by which earth is composed of (i.e.) Lithosphere, hydrosphere and Atmosphere and their equilibrium. Weather and climate, soil types, forests, natural vegetation, transport, distribution of population export, import harbors, industries etc.

**Achievement:** Achievement in the view of education is reaching high level from the existing state. Achievement in the view of education is attaining/reaching high level targets i.e. scoring high marks, improving handwriting form the existing state.

a. Indicate that the significance of sensory cues in largely dependent on their incorporation into large cognitive entities and on the functional state of the brain.

   - Awareness of responsibility as a local, national and international citizen.
   - Interest in lifelong learning.
   - Flexibility and adaptability
   - Creativity
b. The dictionary of behavioral science defines achievement as the level of proficiency attained in scholastic or academic work. According to the dictionary of psychology – Robert & et.al. (1979).

c. “Academic Achievement is specified level of attainment or proficiency in academic work a evaluated by the teachers by standardized tests or by a combination both.

d. Academic achievement is more important for learning and for personality development of a student. Student of the same age show enormous differences in mastery of their school subjects.

**Academic Achievement:** A measure of knowledge gained informal education usually indicated by test scores, grade points, average, and degrees. Successful accomplishment of performance in particular subjects, areas/course, usually by reasons of skill, hard work, and interest typically summarised in various types of grade, marks, scores or descriptive commentary.

**Gain Score:** The comparison of pre and post test scores in order to measure the extent of benefit form a learning experiences.

**Tactile Language:** Language through the sense of touch.

**Teaching:** The processes of helping pupils acquire knowledge skills, attitudes, and / or appreciation by means of a systematic method of instruction.

### 4.8 METHODOLOGY

#### 4.8.1 Experimental Method

Among the research methods, experimental method is considered to be a scientific method of research. It provides a systematic and logical way for answering the research questions. It is the best way to establish cause and effect relationship between variables. It helps to test hypotheses of causal relationships between variables.

This method is considered to be the best because it provides for a high degree of control over extraneous variables and manipulation of variables. It reduces bias and increases reliability. It also permits drawing influences about causality. The researcher can manipulate the independent variables, since they decide the nature of treatment to
whom it is to be applied and to what extent experimental design enables the research to go beyond description and identification of relationship to partial determination of what causes them. The Educational purpose of experimentation is to predict Educational event in the experimental setting. The ultimate purpose is to generalize the relationship along variables. So they may be applied outside the classroom to a wider population of interests. Based on the above advantages of experimental research the investigator has adopted an experimental design for present investigation (Dash Nib Educational Das, 2007).

Experimental design is the blue-print of the procedures that enables the researches to test hypotheses for reaching valid conclusion about relationship between independent variables (James A. Banks, 1997).

4.8.2 Quasi Experimental Design

According to Lim (1997) detailed work be undertook to gain a better understanding as to how partial computer based learning, Package Wine on could be used to best benefit his students learning of economics and to ascertain of its use could result in a statistically significant increase in examination scores. The experimental section of thesis. It is probability earliest to describe his experimental work in the context of stages that we have outline above (Clive Opie, 2004). The word Quasi means “as if” or “to a degree” Thus a quasi experiment is one that resembles an experiment but lacks at least one of its defining characteristics. Quasi experiments are score times called export factor or after the fact experiments because the experiment is conducted after the groups have been formed.

Cook and Campbell (1976) defined it as an experiment that does not permit random allocation of subjects to groups. Our definition includes lack of control over other aspects of the experiment, as does their discussion of particular Quasi-experimental design. Donald (2003) stated that the research procedure in which the scientist select subjects for different conditions from pre existing groups. Life presents certain situations occasionally where random selection and assignment are not possible. Such experiments carried on under conditions where it is not possible to guarantee randomness, must rely upon designs that are called quasi experimental designs. It is thoroughly that the researcher be thoroughly aware of the specific variables the design facts to control and to take these into account in the interpretation
of data (Paul D. Leedy, 1985). The method observes existing conditions and searches back through the data for possible casual factors (Paul D. Leedy, 1985). Kerlinger calls them ‘finally designs’, Van Dalen uses the titles “designs with minimal control” for grouping these designs. Quasi experimental design is the nomenclature used by Christensen Campbell and Stanley (1966). According to Campell (1968) the phrase quasi experimental designs refers to the application of an experimental mode of analysis and interpretation to bodies of data not meeting the full requirements of experimental control.

**Quasi-Experimental Designs**

In quasi-experimental designs, random assignment of members to the experimental and control groups is not made but random selection of experimental and control groups among the groups available is made and as such the initial equivalence of groups is not assured.

**The Non-Equivalent Pretest-Treatment-Post test Design**

Two groups as they exist (say section A and B or School A and School B) are selected and one group is taken to be the experimental group and the other the control group. Pre-tests are administered to both the groups. Treatment is given to the experimental group. The control group does not receive any treatment. After the treatment, post-tests are conducted. The differences in the post-test and pretest measures are calculated separately for the two groups. The significance of difference between the difference measures of the two groups is computed. For examples if $T_2 - T_1 = DE$ for the experimental group and $T'_2 - T'_1 = DC$ for the control group, then we test the significance of the difference between DE and DC. If the difference is significant, then we conclude that the treatment is effective.

This is the most common design being adopted in the so called experimental researches in education. Randomisation of groups generally will not be possible in the existing classroom and school administrative structures. So often we are satisfied with this design. Initial differences if any exist between the two groups, it can also be controlled by a statistical technique, known as Co-variance analysis.
4.9 RESEARCH DESIGN

Experimental design should enhance experimental validity but experimental validity does not depend on experimental design alone. The specifics opt the experiment have an influence and number of things can happen to threat the experimental validity. There are usually many possible ways to explain the outcomes of a study. One group – pre test – post test design is adopted in this study due to purposive sampling.

One Group Design

One group experiment involves a single group to which is applied an experimental factor or factors. Changes in the outcomes are determined by measuring the dependent variable before and after, the group is treated with experimental factor.

For example, Group A may be tested for its knowledge in a topic (T₁ be the mean score for the pre-test). Group A may be taught the topic with a particular method, say using audio-visual aid. The group may be administrated the same test (T₂ the mean of Post-test scores). The again in the mean score is attributed to the treatment namely, the audio-visual method. The same group may be pre-tested and post tested, using a similar test and similar topic after the use of project method. The gains by the two different methods amy be compared.

\[
\begin{align*}
\text{T}_1 & \quad \xrightarrow{X_1} \quad \text{T}_2 \quad & \text{T}_2 - \text{T}_1 \quad \text{(Gain)} \\
\text{T}'_1 & \quad \xrightarrow{X_2} \quad \text{T}'_2 \quad & \text{T}'_2 - \text{T}'_1 \quad \text{(Gain)}
\end{align*}
\]

One group design is simple to plan and operate and is adopted to class-room use and provides stimulus for better class-room teaching. But this method has several limitations:

1) There is carry-over effect of attitude or method from one phase of the experiment to the other. The practice effect produced by writing one test affects the results of the next.
II) Learning speed cannot be assumed to be the same at different stages of the learning process.

III) Maturation of children, during the course of the experiment also affects their later performances.

IV) Even if great care is taken, there is inequality in tests devised to measure the gain.

V) The novelty of the experimental treatment and pride in participating in experiment among the members of experimental group, and the researcher's enthusiasm in introducing the treatment (competency or enthusiasm in the new method) would favorably affect the experimental group.

The Static Group Comparison Design

Two groups as such are selected and treatment is given to one group and the other group is not exposed to treatment. Post tests are given to both the groups. The difference in the post test results of the two groups will reveal the effect of the treatment.

\[
\begin{array}{c}
\text{Gr I} \xrightarrow{X} T_2 \\
\text{Gr II} \xrightarrow{X} T'_2 \\
\end{array}
\]

(No Treatment)

In this design, though there is a control group, the experimental and control groups are not equated. The initial difference will be reflected in the post-test measures also and hence the difference in the post-test measures can not be taken as due entirely to the treatment the experimental group. Thus this design is also a poor design wanting much in internal validity.

Population

A universe might be a study of all the inmates of a particular penitentiary at a particular time. (William J. Grade, 2006). A universe of data consists of the totality of those data within certain specified parameters (Paul D. Leedy, 1985). The term universe/population means simply an "area surrounding the problem which may
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contain facts relevant to the problem (Paul D. Leedy, 1985). The word comes form uni, ‘one’ and ‘verte’ ‘to turn’, that which revolves or turns about one central inquiry. A sample is that represent a large population (Zina O. Leary, 2004). A sample is relatively a small subject of a population that is selected to represent or stands for the population (Gary. W. Heiman).

Population is a statistical concept which means a group of larger number of units from which a smaller group of some units is selected and used for achieving some purpose. (L.P. Aggarwal, 2005). In psychological research it is in general the finite population about which conclusions are drawn and which can be listed and counted. The populations are defined in terms of their specific characteristics. Target population more often defined as all the members of a real or hypothetical set of people, events, objects or other units. Populations are homogeneous as well as heterogeneous with regard characteristics.

Sampling may be defined as the selection of part of an aggregate or totality on the basis of which a judgment or influence about the aggregate or totality is made. Cohen coded that there is of course clear cut answer for the connect sample size depends upon the purpose of the study and the nature of the population under scrutiny. (S.P. Singh, 2002). Sample is a subset from a larger population.

According to King “The law of statistical regularity lays down that a moderately largest number of times chosen at random from large group are almost same on average to possess the characteristics of the large group”. Law of Inertia of large numbers is the corollary of the first law. Everything being equal, the larger the sizes of the sample more accurate are likely the results. (Krishnakumar, 1999).

- In every branch of science we lack the resources, to study more than a fragment of the phenomena that might advance our knowledge (W.G. Cocharan).
- A fragment is the sample and a phenomenon is the population.
- In the social sciences, it is not possible to collect data form every respondent relevant to our study but only from some fractional part of the respondents. The process of selecting the fractional part is called sampling (David.S. Fox). A select group of some elements form the totality of the population is known as the sample (L.P. Aggarwal, 2005)
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Sample is one which is so drawn that he researcher form all pertinent points of view has not reason to believe a bias will result. (William J, Goode, Paul K. Hatt, 2006). M.Cr Kendall & B. Babington – Smith (1998) stated a sample is the sub set of the universe

According to W.G. Cocharan, “In every branch of science we lack their resources to study more than a fragment of the phenomena that might advance our knowledge. (K. Nagarajan, 2005). For studying any population it is difficult to study the whole population or universe. Studying in entire universe is not viable in many ways. It is therefore convenient to pick up a sample out of the universe proposed to be covered by the study (W.Cr. Coharan & Wilkineson and Bhadarkar, 2000). The population of this study is elementary education teacher trainees, that is the preservice teachers for classes I std – VIII std.

Purposive sample

Purposive sample is selected non-randomly but for some particular reason. That is chosen for some characteristic that it possesses. Purposive sample can be considered to constitute population. Purposive sampling is a method where by groups of cases are selected that have certain characteristics or control that are highly related to previously determined or known values of the population being sampled. It derives its name from the fact that such samples are selected purposively judgment /purposive sample is non-probability technique. If we have reason to believe that a particular group or stratum, satisfactorily represents the population then we can select that group as the sample for our study (Paul. D. Leedy, 1985).

Selection of the Sample

The present investigation was carried out in DIET affiliated to the Government of Tamil Nadu (Secondary Grade Teacher Education) located in Uthamasolapuram, Salem District.

DIET is located in the outskirts of Salem town with strength of (48+50+28=126) students studying in I year, DTE, II Year DTE (Regular batch) and II year DTE (special batch) more than 100 teacher trainees are studying different optional subjects at +2 level of DIET teacher trainees who had taken maths biology, maths computer, physics, chemistry, arts and vocational groups. I year teacher trainees 48 in number and they formed the sample for the study. The investigator’s
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sampling technique which is non probability sampling. She selected purposive sampling or judgmental sampling. The investigator chosen the sample based on two they criteria, would be appropriate for the study. This is used primarily when there is a limited number of people that have expertise in there are being researched.

Variables selected for the study

Variables are the condition or characteristics that the experimenter manipulates, control or obsequies (Best, 1993). In experimentation the manipulated variables is called as independent variable. It is under the direct control of the experiments who may vary it in any way desired (Saxona, 1979). Variables is some aspect of a testing condition that can change or take on different characteristics with different conditions (Donald H. Mc Burvey, 2003).

The dependent variable is a measure of the behaviour of the subjects that reflects the effects of the independent variable.

Independent Variables is one that is believed to cause some change in the value of the dependent variables as well as the condition manipulated or selected by the experimenter to determine its effect on behavior. The independent variable can often be thought of as what the researcher does to the subject, and the dependent variable as what the subject does back. Independent variables are called subject variables. Independent variables are called subject variables. (William J. Goode Paul K. Hatt, 2006).

The present investigation is an attempt to determine the role of Perceptive Thinking Skill on enhancing geography achievement among DIET Teacher Trainees and to estimate the extent of relationship between selected variables.

a. Perceptive Thinking Skills are the independent variable for the present investigation.

b. Geography achievement is treated as dependent variables

The following are the demographic variables

a. Gender – The study is conducted with both boys and girls.

b. Maturation – Investigation is carried out for a period of 6 weeks

c. Age – students of the age group between (19 -23 years) have been
chosen.

d. Location – Investigation is carried out in the same classroom situation in the same institution.

4.10 INSTRUMENTATION

This section presents the description of Instruments used in collection of the data required for the study. The questionnaire was constructed taking into account these aspects. The items were selected in accordance with following criteria.

1. The question should be simple and direct.
2. It should neither be too easy nor too difficult.
3. It should be within the scope of the study and also within the level of knowledge of the Perceptive Thinking Skills on enhancing geography of achievement among DIET teacher trainees.

Keeping in view of the above Criteria, the investigator constructed the items of the tool. Sufficient care has been taken with its constructs. The questions are worked properly in order to understand easily without giving any change for ambiguity.

4.11 PROCEDURE ADOPTED FOR DATA COLLECTION

All the forty eight DIET Teacher trainees belonged to Uthamacholapuram DIET were first administered Perceptive Thinking Skills questionnaire. The answered sheets were scored according to the scoring key mentioned along with the tool. The calculated scores were taken as pre test scores for the Perceptive Thinking Skills of DIET teacher trainees. Then the investigator administered geography achievement tool to the DIET teacher trainees. The answered sheets were scored according to the scoring key mentioned along with the tool. The calculated scores were taken as pre test scores for the Geography Achievement of DIET teacher trainees. DIET teacher trainees were allowed to practice perceptive thinking skill strategies for a period of 6 weeks.

The investigator administered a pre-assessment to measure Perceptive Thinking Skills (P1) is geography achievement as present level among DIET teacher trainees. Then provided the experimental treatment to develop and measure the level of Perceptive Thinking Skills and geography achievement through progressive
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assessments. Then post assessment is conducted to measure the level of Perceptive Thinking Skills and geography among DIET Teacher Trainees.

During the treatment, the investigator assessed teacher trainees' Perceptive Thinking Skills and Geography Achievement through the progressive tests. The investigator applied the flux boards' explanation to DIET teacher trainees with the clear explanation to geography content. They went to the education technology department, to show the CD visual packages to DIET teacher trainees especially, How does the Tsunami originated, and eruption of volcanoes. Since the DIET teacher trainees observed the classes, the investigator assessed their Perceptive Thinking Skills and Geography Achievement through questionnaires.

Implementation of Strategy – An Overview

Before beginning the lesson the researcher enquired the student whether they have the necessary books, notebooks. Britannica encyclopedia, D.M. Picturepedias, and etc. The researcher creates a cordial atmosphere between the students and herself by way of asking some general questions. The DIET Trainees are properly seated. A bunche of colorful picturepedias are distributed to each and every students on the table. The students are asked to identify the geographical features and its habits. Here the teacher trainees previous knowledge is tested. The researcher explains the features that emotional features of Glacier, Volcano, River, State and Capitals of India, Tectonic plate, Rift valley, Panthazala and etc. Here goal is defined and set. As this is a common features are in a fluvial cycle of erosion the trainees to have previous knowledge of the various feature.

The researcher asked the Teacher Trainees to closely observe the various parts and describe the colour, formation, size and shape etc. of the different landscape here the teacher trainees senses are stimulated. Miniature models, CD, Visual packages are shown to the Trainees and explained to the Trainees. Each trainee is give a picture pedia, visual dictionary, color Xeroxes of the fluencies structure and flux planners to displayed the researcher to the trainees. Here the sense training is given (both PTS and geography achievement) to the trainees the researcher explained the drawing it on the blackboard making different parts with color chalks. Thus the audio-visual and tackle senses are stimulated. As s result of this, the characteristic features of various part of the flamer are retained in the short term memory. The trainees are asked to
Methodology

draw the diagram on their note books. This reinforces their memory and the content is stored in the long term memory then the teacher trainees are asked to do miniature model of the fluvial structure of the river, volcano, glacier, wind and tectonic plates. One of the trainees asked to draw the structure of the characteristic features of various fluvial region. Other trainees asked to map the feature with color chalks. Then the trainee is asked to explain the landscape features. Now each trainee is given to show the CD. Visual package of the content to not down the parts of the fluvial cycle of the region. Here the sense experience of the trainee is reinforced by recalling the previous knowledge of fluvial features, states and capitals, seasons, solar family. By comparing with part experience is the generalization of the fluvial feature is dram and re-registered in the remind. Some of the trainees are evaluated by asking some questions. If their feedback is not satisfactory, the researcher again invited the trainees and some topics are repeated until all the students thoroughly understand the lesson.

Perceptive Thinking Skill Inventory (PTSI) constructed by Investigator was administered among all 48 students of math/Bio, Computer science, Arts and Vocational group. Pre assessment scores on Perceptive thinking skill were collected. Inventory to assess Perceptive Thinking Skill was constructed and validated by the investigator. Geography achievement test was developed and validated by the instigator. Pre-assessment scores on geography achievement (GA1) among all students were collected – The student was allowed to practice Perceptive Thinking Skills strategies for period of 6 weeks. Progressive assessments on Perceptive Thinking Skill and Geography achievements were administered and the scores were collected. Thus pre, progressive and post assessment scores on Perceptive Thinking Skill, and they were converted in to percentage scores for the purpose of comparison. The percentage scores on Perceptive Thinking Skill and Geography achievement were computed for analysis.

4.12 CONSTRUCTION AND VALIDATIONS OF TOOLS

The investigator on the basis on review of related studies and correlates on Perceptive Thinking Skills on geography achievement identified that influence Perceptive Thinking Skills on geography achievement. Hence the investigator decided to measure the effect of Perceptive Thinking Skills with their respective tools.
4.12.1 Perceptive Thinking Skills Inventory (PTSI)

To measure the level of Perceptive Thinking Skills of the subjects, the investigator constructed and validated the tools on the basis of various dimensions of Perceptive Thinking Skills. The first section consists of pictures of with 5 marks for each picture weightage. The second section consists of 5 items of choose the correct picture that follow the series from the answers given by the side. Each problem is awarded a score of 1. Third section consists of 5 items. One mark is awarded to the correct answer for rearranging the jumbled letters forming a meaningful word. The fourth section consists of 5 items for finding out the different figure (odd man out) in each series. One mark is awarded to the correct answer and 0 to the wrong answer. The fifth section consists of 5 items. One mark is awarded to the correct answer. The sixth section consisted 2 categories. The first category is finding out and writing down the hidden things, second category is draw the missing parts of the diagrams. One mark is awarded for correct response. The tool was consulted with experts. The content validity of the tool was established by Dr. Rajendran who is a former Professor in Psychology in Annamalai University. The investigator constructed the tool of some pattern for pre assessment, progressive assessments and post assessment.

4.12.2 Geography Achievement Test

Achievement tests were used for purpose of measuring achievement in any specific subject. Tests were constructed by the investigator in the units of geography content. Question papers were prepared based on the opinion of experienced geography teachers.

The question paper consists of sections as follows.

<table>
<thead>
<tr>
<th>Section</th>
<th>Type of Question</th>
<th>Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Fill up the blanks</td>
<td>5</td>
</tr>
<tr>
<td>B</td>
<td>Very short answers</td>
<td>10</td>
</tr>
<tr>
<td>C</td>
<td>Brief answer</td>
<td>15</td>
</tr>
<tr>
<td>D</td>
<td>Essay Question</td>
<td>10</td>
</tr>
<tr>
<td>E</td>
<td>Labeled the diagram</td>
<td>10</td>
</tr>
</tbody>
</table>

In section A under fill up / Choose the best answer 10 items are given. One mark awarded this item.
Methodology

In section B under very short answers 5 items were given, to write the answer for all questions.

Under section C Brief answer were given and write the answer for all questions.

Under section D Essay Question with either or choice.

Under section E labeled the part of the diagram.

Some of the sample items are given below

Section – A (10 items)

Fill up / choose the best answer.

Ex. A Sharpened edges on the glaciated area is called

The South Indian plateau is (Malwa/ Deccan / Chotta Nagpur)

Section – B (5 items)

Write very short answer

Ex. Define ‘Halley comet’

Section – C (5 items from 7)

Write a brief answer

Ex. Explain the structure of the earth.

Section – D (either or)

Answer in Essay

Ex. Explain the physical features and rivers of given map of Tamil nadu.

(or)

Define underground water? Explain the eroisonal and depositional features of Karst topography.

4.13 RELIABILITY AND VALIDITY OF TOOLS

The validity of the test items were determined by the content analysis. The content validity was established by test and retest method. It was found to be which was significant. The critical analysis done by experienced geography professor in Geography Prof. Dr.Vasantha Kumar, Madras University, Chennai. S.Madha
Methodology

Suresh, Professor, Madras University, S. Saravana Bhavan, Professor, Govt. Arts College, Coimbatore. R. Devaraj, Professor, Govt. Arts College, Coimbatore.

4.13.1 Establishing Reliability for the Tool

Reliability is defined as the extend to which measurement reflects true individual difference among examinations. Individual differences are considered to be true if they represent chance factors or conditions. A perfectly reliable set of measurements would be unaffected by random or chance events and would therefore be capable of measuring some educational and psychological attributions perfectly of a tool. Many test are available to test reliability

1. Test and Re-test method
2. Split half method
3. Kuder 20 (Kuder Research Formula)
4. The alternate method
5. The Rational equivalence method

In this study, test and Re-test method was adopted to find out reliability of the (Perceptive Thinking Skill) PTS tool and split half method was adopted to find out reliability of geography achievement tool (John W. Best, 2005).

4.13.2 Validity

The extent to which a test measures what it purports to measure. This is often not a simple yes no answer as there are many types of validity that need to be assessed. A scale posses validity when it actually measures what it claims to measure. It can at once be seen that this very difficult to establish, since as was pointed out earlier, a scale measures a continuum which is inferred to exist form the items themselves, there are frequently. No independent measures which can be used as a criterion of validity for the scale. Nevertheless every scale, to be useful, must have some indication of validity. the consequence of this is that much work re mains to be done with regard to validation of scales, which are discussed below. According to Thomas Cook and Donald Campell (1976) list four types of validity that must be considered in designing and evaluating a piece of research internal validity (Donald, 2003).
Validity and construct validity external validity statistical validity. The extent to which a study provides evidence of a cause-effect relationship between the independent and dependent variables. Validity is a measurement the property of a measurement that test what it is supposed to test (Donald, 2003). The logical connection between the scale points and the concept of social distance has already been mentioned (William J. Goody, 2006). Validity is concerned with the soundness, the effectiveness of the measuring instrument. Validity would raise such questions as what does the test measure and how well does it measure it.

4.13.3 Reliability

Reliability here is a function of the number of judges and of the number of discriminations required. Reliability is best measured here by the test-retest method, although the multiple forms technique can also sometimes be applied (Donald, 2003). A scale of this type is not easily tested for reliability by either the multiple forms or the split-half technique. The test-retest approach is the most effective measures of reliability of such a scale (William J. Goode, 2006).

Reliability - It deals with accuracy measure what it intended measure (D.Leedy, 1985). The degree to which a score as stable and consistent when measured at different times, in different items within the same scale. Reliability in the degree of consistency that the instrument or procedure demonstrate whatever it is measuring, it does so consistency. Test-retest the scores on a test will be highly correlated with scores on a second administration of the test to the same subjects at a later data if the test has good test retest reliability. Because individual scores may change due to having taken the test before, we are interested here in the relative position of the individuals score. That is, does every one's scores change in the same direction and about the same amount from test one to test two? Test-retest - correlating the scores on two or more successive administrations of the test (Administration No.1. Vs administration no.2, John W.Best, 2005).

Test-retest method provides the strength of relationship between tests for each component and interest score. Scientist measures the effects of these factors on reliability. Though application of the scientific method and in the present analysis applied a test-retest design. (Larkey & Jennifer L. knight, 2002). Test-retest method provides the strength of relationship between tests for each component and interest.
scores. Scientist measure the effects of these factors of reliability through application of the scientific method, and in the present analysis applied a test – retest design. Test-retest. Test-retest: As the name implies this means that the scale is applied twice to the same population and the results compared. The statistical technique of comparison may employ any of the common measures suitable for this purpose. Some form of correlation is generally used however. A high level of association must be demanded before reliability can be assumed (J. Goode Paul K. Hatt, 2006).

4.13.4 Pilot Study

The pilot study was conducted in five private TTI’s namely Salem District. Sri Laxmiammal TTI, Belur, Sri Jeyajothi TTI, Tharamangalam, Vetrivel TTI, Tharamangalam, Vinayaka Mission TTI, Seeragapadi, Anai Theresa TTI, Thammanpatty in Salem District. The validity and reliability were found. Validity of the tool was found by the educational experts. Reliability was found by using-retest method and it was found be 0.75. The pilot study was conducted in five private TTI’s in Salem District during March – April 2008.

Table 4.1 Pilot Study

<table>
<thead>
<tr>
<th>Sri Laxmiammal TTI</th>
<th>Belur</th>
<th>Salem</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sri Jeyajothi TTI</td>
<td>Tharamangalam</td>
<td>Salem</td>
</tr>
<tr>
<td>Vetrivel TTI</td>
<td>Tharamangalam</td>
<td>Salem</td>
</tr>
<tr>
<td>Vinayaka Mission TTI</td>
<td>Seeragapadi</td>
<td>Salem</td>
</tr>
<tr>
<td>Anai Therasa TTI</td>
<td>Thammanpatty</td>
<td>Salem</td>
</tr>
</tbody>
</table>

These tests are perceptive thinking skill pre-test, perceptive-thinking skill progressive test 1, perceptive-thinking skill progressive test 2, perceptive-thinking skill progressive test 3 and perceptive-thinking skill post-test, Geography Achievement pre-test, Geography Achievement Progressive test 1, Geography Achievement Progressive test 2, Geography Achievement Progressive test 3 and
Methodology

Geography Achievement post-tests were conducted. The validity and reliability were found. Validity of the tool was found by the educational experts. Reliability was found by using test-retest method and it was found be 0.75.

4.13.5 Threats to Internal Validity

Threats to the internal validity of an experiment include events out side the laboratory, maturation, effects of testing, regression effect, selection and mortality (Donald, 2003). This term and the internal validity is the freedom from bias in forming conclusions in view of the data. It seeks to ascertain that the changes in the dependent variable are result of the influence of the independent variable rather than the manner in which research designed (Paul D. Leedy).

The quality of the experiment depends on so well various threats to internal validity are controlled. Internal validity means that the changes observed in the dependent variables are due to the effect of the independent variable, not to one other unintended variable. Campbell and Stanley have identified threats to internal validity. The threats which affect the internal validity of the experiment are the following.

History

Occasionally one or more unanticipated and unplanned events may occur during the research and affect the results. Such events are referred to in educational research as history. During this experiment unexpected events did not occur. Thus this threat was eliminated.

Selection

Differences between the subjects in the groups may result in outcomes. According to the law of probability the groups compared too significantly differ from one another in their composition. The subjects should be equal in all respects. As there is no control group in this experiment, this threat was nullified.

Testing

The effect of pre test upon the scores of a subsequent test is called testing threat. In experimental studies it is common to test subjects at the beginning and the end of the study. If considerable improvement is found in the post-test score, the researchers may conclude that this improvement is due to experimentation, an alternative explanation is that is may be due to the use of pre-test.
Methodology

In this investigation pre-test, progressive tests and post test were conducted. Hence this threat was reduced to minimum.

Instrumentation

Differences in results due to changes in the measuring instruments between the pre-test and post-test may constitute a threat to the internal validity. The same type of tools to measure the Perceptive-Thinking Skills and geography achievement test were used throughout this study. Hence this threat was nullified.

Mortality

Sometimes the loses of subjects may occur during the study and this is known as mortality threat. During this study, such subject loss did not occur. Hence this threat was eliminated.

Statistical Regression

As effect may due to respondents being identified on the basis of extreme high or low scores. The subjects should be selected in equal numbers from all levels of scoring. In this study all the teacher trainees belong to various groups and from are various levels. Their achievement scores based upon their category, caste and communal rotation.

Maturation

The number of factors associated with the passage of time not envisaged in the investigation might cause hikes in subjects’ scores. This is known as “Maturation threat”. The total duration of the study was 10 weeks. So this threat was eliminated.

Selection Maturation Interaction

The effect of maturation not being consistent across the groups because of some selection factor constitutes this threat. The subjects selected were similar in all respects i.e. age, academic achievement in XII level etc. Hence this threat was nullified (Donal, 2003).

Threats to External Validity

Threats to external validity include problems arising from generalizing to the subjects, other times or other settings (Donald, 2003).
Methodology

This type of validity is concerned with the generalizability of the conclusion reached through observation of a sample to the universe and difficulties in generalizing the findings of experimental research.

Interaction Effect of Testing

Pre-testing interests with the experimental treatment and causes some effect such that the results will not be generalized to unprotected population. All the teacher trainees were subjected to this type of program. There is no such effect in this study.

Interaction Effects of Selection Biases and the Experimental Treatment

This refers to the effect of some selection factor of intact groups interacting with experimental treatment that would not be the case if the groups had been randomly formed. All the available subjects were selected, hence this threat was eliminated.

Multiple Treatment Interference

When the same subjects receive two or more treatments there may be a carry over effect between treatments such that the results cannot be generalized to single treatment. Hence the treatment was given in the routine classes of teaching geography, this threat was eliminated.

Artificiality of the Experimental Setting

In an effort to control extraneous variable, the researcher imposes careful control which may introduce a sterile or artificial atmosphere that is not at all like the real situation about which generalizations are designed. The reactive effect of the experimental process is a constant threat. By conducting the experiment in the actual classroom this kind of threat is eliminated (Paul D. Leedy, 1985).

A good experimental design is determined on the basis of attaining maximum internal validity and external validity. The selection of a particular experimental design is based on the purpose of experiment, the type of variables involved in the study and the conditions or limiting factors under which it is conducted. The design deals with how the subjects are selected, the way in which the variables are to be manipulated and controlled, the method of data collection and the types of statistical analysis to be employed in interpreting data relationships.
4.14 DELIMITATIONS OF THE STUDY

The following are the delimitations of this study

- This investigation is restricted only to 48 DIET Teacher trainees II year (2007-2008) Uthamasolapuram, Salem – 10.

- The syllabus for elementary and upper primary geography content alone was considered for experimental purpose.

- The investigator adopted single group experimental design. This design did not use any control group.

- The study was conducted for 10 weeks.

4.15 LIMITATIONS OF THE STUDY

Limitations are those conditions beyond the control of the researcher that may place restrictions on the conclusions of the study and their application to other situation. (Venkataiah, 2001).

The limitations of the study should to explain to the readers. An explicit statement of this kind not only gives an important datum to the reader but also protects the researcher from obvious criticism and from his own indiscretion (William J. Goode Paul K. Hatt, 2006).

1. This study is limited to Salem DIET in Tamil Nadu.

2. This study deals with only perceptive-thinking skills and geography achievement of DIET teacher trainees.

Duration of the treatment

After administering the pre assessment in Perceptive Thinking Skills and Geography Achievement, the subjects were exposed to Perceptive Thinking Skills strategies Geography Learning for a period of 10 weeks.
### Table 4.2 Phases of Experimentation

**Treatment / Experiment schedule**

<table>
<thead>
<tr>
<th>Experiment phases</th>
<th>Activity</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase I</td>
<td>Identifying the contents in Geography of Teacher Trainees which involve of Perceptive Thinking Skills</td>
<td>1 week</td>
</tr>
<tr>
<td>Phase II</td>
<td>Identifying important components of Perceptive Thinking Skills Process</td>
<td>1 week</td>
</tr>
<tr>
<td>Phase III</td>
<td>Selecting strategies on developing Perceptive Thinking Skills</td>
<td>1 week</td>
</tr>
<tr>
<td>Phase IV</td>
<td><strong>Pre-assessment administration</strong></td>
<td>1 week</td>
</tr>
<tr>
<td></td>
<td>1. on Perceptive Thinking Skills using Perceptive Thinking Skills inventory</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. on Geography Achievement through achievement tests</td>
<td></td>
</tr>
<tr>
<td>Phase V</td>
<td><strong>Progressive Agreement</strong></td>
<td>5 weeks</td>
</tr>
<tr>
<td></td>
<td>Implementation Perceptive Thinking Skills Strategies conducting progressive assessments on Perceptive Thinking Skills weekly once. Administering progressive assessment on geography achievement</td>
<td></td>
</tr>
<tr>
<td>Phase VI</td>
<td><strong>Post Assessment</strong></td>
<td>1 week</td>
</tr>
<tr>
<td></td>
<td>Conducting post assessment on Perceptive Thinking Skills Geography Achievement</td>
<td></td>
</tr>
</tbody>
</table>
Figure 4.1 Interpretations on Perceptive Thinking Skills

- Photo state picture identification – Identification of specific places in the colour pictures
- Solving the Problem figures
- Rearranging letters
- Finding the odd man out
- Drawing the incomplete picture
- Finding the hidden things
- Draw the figures form given shape / numbers
- Drawing the continuous figure
- Solving the riddles
Figure 4.2 Indra’s Model on Perceptive – Thinking Skill on Enhancing Achievement in Geography
Indra's Model of Perceptive-Thinking Skills on Enhancing Achievement in Geography

### Focusing Concepts
- **Cutaneous**
- **Olfagatory**
- **Auditory**
- **Visionary**
- **Kinestheticss**

### Involving in Various Perceptive-Thinking Skills as the Concept Demands

<table>
<thead>
<tr>
<th>Concept</th>
<th>Motivation</th>
<th>Sensation</th>
<th>Cutaneous</th>
<th>Olfagatory</th>
<th>Auditory</th>
<th>Visionary</th>
<th>Kinestheticss</th>
</tr>
</thead>
</table>

### Understanding the Concepts
- Identification
- Remembering
- Problem solving
- Differentiation
- Classification
- Imagination
- Grouping
- Organizing
- Describing
- Elucidating
- Rearranging
- Manipulating ideas
- Understanding the Concepts

### Short Term Memory
- Top down Processing
- Evaluating
- Judging
- New inference
- Generating new idea
- Analyzing

### Long Term Memory
- Bottom up processing
- Discussion Synthetic thinking
- New Prediction
- Higher order thinking
- Recalling

### Achievement
- Recalling
- Reviewing
Methodology

Intervention on Perceptive Thinking Skills

• The investigator collected colour pictures depicting the various concepts in geography from service reporter, D.K. illustrated picturepedia, and also from Encyclopedia. This picture consists of important geographical concepts. The pictures are given to the subjects and they were triggered with some questions. These questions are triggered the subjects various thinking skills such as Abstract Thinking, Concrete Thinking, Productive Thinking, Converse Thinking and etc...

• Then the investigator gathered on the problems on reasoning with the answer set. The subjects used their problem solving skills to find out the next continuous figure in the answer set. The investigator presented jumbled letters of the words. The subjects rearranged them using their thinking skills. The investigator collected words and figures, the subjects find out odd man out from this figure. They used their inductive as well as deductive thinking skills in order to find.

• The investigator presented the half portion of the diagram so that the subjects used their reflective and associative thinking skill to complete the diagram. The investigator collected some riddles regarding the geography content, the subjects find out the correct technical terms in for these riddles. Then the investigator presented the subjects some type of shape, the subjects organised them into diagram through their productive thinking, synthetic thinking, reflective thinking, converse thinking and divergent thinking skills.

Identification of Concepts in the Pictures: The investigator showed the color pictures of the subjects, they identified the picture, and answered the questions, presented in each picture. For ex.

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>🌟</td>
<td>🌟</td>
<td>🌟</td>
<td>🌟</td>
<td>🌟</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>a</th>
<th>b</th>
<th>c</th>
<th>d</th>
<th>e</th>
</tr>
</thead>
<tbody>
<tr>
<td>🌟</td>
<td>🌟</td>
<td>🌟</td>
<td>🌟</td>
<td>🌟</td>
</tr>
</tbody>
</table>
a. What are the different planets do you see?

b. Which are the furtherest and the nearest planets to the sun?

c. What do the different colors in the planet of earth indicate?

d. What does the black color indicate?

e. Why does the planet Setna differ from other planets?

**Problem Figures:** The investigator collected the problem figures set with suitable answer sets.

**Choose the correct picture that should follow the series from the answers given by the side**

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Rearranging Letters:** The investigator presented jumbled letters to form meaningful words.

a. ANKSIRAL

b. USTARLAIA

c. NOLEM

d. YDAIRF

e. YOGEGRAPHY
Odd Man Out

The investigator made up of figures, subject

e. Find and the different figure in this series
d. Draw the full diagram from given half diagram

e. Joining the dots and give the name of the figures.

Draw the Next Half of Picture

The investigator supplied varied exercises, such as

a. Chooses the correct picture that should follow the series from the answers given by the side

\[ \text{Protection Mountains} \]

b. Rearrange the letters to form a meaningful words: S S C E C U S

c. Find out the hidden things

d. Draw the missing parts of the figure,
e. Organizing the figure from given numbers/shapes:

\[ 1 \ 2 \ 3 \ 4 \ 5 \ 6 \ 7 \ 8 \ 9 \ 10 \]
Methodology

f. Underline the odd man out

1. △ ● ●
2. /
3. \c
4. \l
5. △ \x

1. Name the state: It has 30 district, 7 rivers, East and south bounded by the seas

Figure 4.3 Geography Achievement – Treatment

- Explanation Using Flux Boards
- Identification of Concepts in Colour Picture
- Construction of Model
- Discussion on Globe
- Atlas Reading
- Map Reading
- Viewing Visual packages in CDs
- Viewing Albums
- Black Board Demonstration
4.16 GEOGRAPHY ACHIEVEMENT

The investigator collected the figures from Encyclopedia, D.K. Illustrated picturepedia, visual dictionary, Encyclopedia of the earth, volcano sea, wind, glacier and etc. then she took the Photostat copies as well as to make the flux board. The following

2 1/2 x 2 1/2 feet (scale)
3 3/4 x 3 3/4 feet (scale)
4 1/4 x 4 1/4 feet (scale)

These flux pictures exemplified the following features about geography content

- Volcano eruption. Features
- Tectonic plate, movement
- Earthquake primary, Secondary and long wave destruction
- Erosional features of earth
- Erosional and depositional features sea wave of Karst topography
- Wind action, erosional and depositional features of wind action and various types of Barchans.
- Earth crust
- Stages of the river, erosional features of the river
- Volcano, earthquake regions, Atlantic ridge of the world.

Then the investigator supplied the 25 color Xerox from science reporter, encyclopedias and visual dictionary to the subjects. The investigator demonstrated all the concepts which demands Perceptive Thinking Skills indirectly. At the same time the investigator provoked the subjects' various thinking skills. The investigator selected the important geographical features volcano, erosional features of glacier, zig zag puzzle, rift valley, under ground water erosional features and as on. The subjects were divided into groups, the investigator made use of some models. After that the investigator conducted the group discussion, atlas reading and map reading. Then the investigator prepared the visual package CD from geography
content uraka Educational CD's. Subsequently the investigator showed the album to the subjects, and stimulated their various thinking skills. Finally the investigator conducted the black board demo classes for that geographical concept Perceptive Thinking Skills very clearly to the subjects.

4.17 SCHEME OF DATA ANALYSIS

In the present study, the relevant data obtained from assessment scores found the pre, progressive and post assessment on Perceptive Thinking Skills and Geography achievement secured by 48 students have been analyzed as follows.

Descriptive Analysis

It provides information about the nature a particular group of individuals. Mean and Standard Deviation were calculated for pre, progressive and most assessment of Perceptive Thinking Skills and Geography Achievement.

Differential Analysis

It provides inferences involving determents of statistical significance of difference among the students with reference to selected variables Perceptive Thinking Skills and Geography Achievement (Pre/progressive and post assessments). It involves tests formulas sample.

Correlational Analysis

Correlational analysis aims at finding out the relationship between two variables. The product moment correlation was used to find the relationship between Perceptive Thinking Skills and Geography achievements.

Partial and Multiple Correlation Analysis

Partial and multiple correlation analysis is used to analyze the inter relationship among the correlated variable like Perceptive Thinking Skills. Partial correlation between Perceptive Thinking Skills and Geography Achievement. Multiple correlation between Perceptive Thinking Skills and Geography achievement in various phases were calculated to find out the combined effect of Perceptive Thinking Skills on enhancing geography achievement.

Inferential Analysis

They allow us to infer something from the data we have. It can be divided it
into two types of tests non-parametric and parametric and it is important that we use appropriate test for data we have collected (Bell and Opie, 2002). A detailed description of the analysis is presented in the next chapter.

Description of Experimental Study

An experiment involves the comparison of the effects of a particular treatment with that of a different treatment or of no treatment. In a simple conventional experiment, reference is usually made to an experimental group and to a control group. These groups are equated as nearly as possible. In the classroom situation, all the students are exposed to the benefits of a new technique while another group in the same class is lead to discontent among a section of the student. Hence the investigator decided to treat the whole class as a single group.
REFERENCE


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