# CHAPTER III

## PROCEDURE OF DATA COLLECTION

### 3.0.0 INTRODUCTION

This chapter provides a description of the procedures and processes used to prepare for collect the data for the study. Sections include the purpose of the study, methodology, sample, design, tools and procedure of data collection and statistical techniques and a brief conclusion.

### 3.1.0 PURPOSE

This study examined how explicit instruction of self-regulated learning strategies impacted ninth grade mathematics classes. Data was collected from students about their use of self-regulation and the strategies associated with self-regulated learning. Standardized test data were used to examine the impact on student achievement. The standardized attitude towards mathematics scale was developed by Dr. Ali Imam (Lucknow) and Dr. TahiraKhatoon (Aligarh) (2015).

### 3.2.0 METHODOLOGY

Methodology is "'a contextual framework' for research, a coherent and logical scheme based on views, beliefs, and values, which guides the choices researchers make". It comprises the theoretical analysis of the body of methods and principles associated with a branch of knowledge such that the methodologies employed from differing discipline vary depending on their historical development. This creates a continuum of methodologies that stretch across competing understandings of how knowledge and reality are best understood. This situates methodologies within overarching philosophies and approaches.

In this research the Experimental method will be employed for the study. The main purpose of a self-regulated learning is to establish an acceptable model that can consistently define the relationship between the independent variables and the dependent variables using the least number of variables possible. The dependent variable of the study was the "self-regulated learning" of the students and the

independent variables were effect of treatment, gender and their interaction on achievement in mathematics.

### 3.2.1 DESIGN

This study used a quasi-experimental design. The independent variables were the two groups, control and experimental. The experimental group received explicit instruction incorporating self-regulated learning strategies into their regular mathematics instruction. The dependent variables were the results from students' self-reported responses on a survey designed to measure the extent to which students are incorporating self-regulated learning strategies into their independent learning behaviors and students' scale scores from their eighth class yearly Mathematics Tests taken by the school.

For this study, student achievement was measured using a pretest/posttest design. The pretest data were collected from students' eighth class yearly Mathematics tests scores from school. The posttest data was collected from students' achievement Mathematics Test scores taken by the investigator. Students who did not have an eighth class mathematics test score were not included in the data. The Non-equivalent control group design was employed for the study.

### 3.2.2 SAMPLE

Sampling is a process used in statistical analysis in which a predetermined number of observations are taken from a larger population. The methodology used to sample from a larger population depends on the type of analysis being performed, but it may include simple random sampling or systematic sampling.

Stratified sampling is a probability sampling method and a form of random sampling in which the population is divided into two or more groups (strata) according to one or more common attributes. Stratified random sampling allows researchers to obtain a sample population that best represents the entire population being studied. Stratified random sampling involves dividing the entire population into homogeneous groups called strata. Stratified random sampling differs from simple random sampling, which involves the random selection of data from an entire population, so each possible sample is equally likely to occur.

In this research the stratified random sampling was used. The size of the sample was 60 students of Balasore district. All students are divided in to two groups.

One Experimental Group and other was Controlled Group. There are thirty students present in each group. For this research two schools were taken randomly named Kansh high school, Kansh and Panchayat high school, Narsinghpur from Balasore district. The students of Panchayat high school, Narsinghpur were chosen as Experimental group and the students of Kans high school, Kansh were chosen as the Controlled group.

The experimental group was taught through the specially designed contents in mathematics. And the controlled group student will be taught through the traditional teaching method. There were two chapter were taken to taught from the class IX Algebra book. The 1st chapter was "Set Theory" and the 2nd chapter was "Real Number".

- Stratified random sampling
- Sample size will be 60
- Experimental group will be 30
- Control group will be 30
- The schools are :
    1. kansh high school,kansh.
    2. Panchayat high school, Narasinghpur.

### 3.2.2 TOOLS

Many different methodologies can be used for data collection and analysis. Most are based around a core set of basic tools. These include interviews, focus group discussions, observation, photography, achievement test, video, surveys, questionnaires and case studies, attitude scale test, etc. In this research there were two types of tools used the first one was Achievement test in mathematics which was developed by the investigator. The second one was Attitude towards mathematics scale which was developed by Dr. Ali Imam (Lucknow) and Dr. TahiraKhatoon (Aligarh) in the year 2015.

1. Achievement test in mathematics - developed by the investigator.
2. Attitude towards mathematics scale - by Dr. Ali Imam (Lucknow) and Dr. TahiraKhatoon (Aligarh) (2015).

### 3.2.3 PROCEDURE OF DATA COLLECTION

Two school of Balasore district will be selected randomly and from each school 30 student of class IX will be selected randomly. One school will be designated as experimental group another school will be designated as controlled group.

The experimental group will be taught through the specially designed contents in mathematics and the controlled group student will be taught through the traditional teaching method. Treatment of 45 days will be given to both the groups as per the respective methods mentioned above before given the treatment of 45 days, the attitude towards mathematics scale (Dr. Ali Imam (Lucknow) and Dr. Tahira Khatoon (Aligarh), 2015)will be administered two both the groups. Previous year mathematics achievement marks of the students of respective groups will be collected from school register.

An achievement test in mathematics would be developed by the investigator and would be administered at the end of the treatment of 45 days to both the groups. Both the tools will score properly and data will be analyzed using the appropriate statistical techniques.

### 3.2.4 STATISTICAL TECHNIQUES USED FOR THE ANALYSIS OF DATA

Statistical methods are mathematical formulas, models, and techniques that are used in statistical analysis of raw research data. The application of statistical methods extracts information from research data and provides different ways to assess the robustness of research outputs.

In this research Mean, Standard Deviation, Percentile, Co-efficient of variation and 2×2 factorial designed. ANCOVA of unequal sized were used for analysis of data.

### 3.2.5 TREATMENT DEVELOPMENT AND IMPLICATIONS

A list of possible strategies was compiled from the studies referenced in the literature review. The purpose of the experimental group was to determine which strategies would be most appropriate for use in ninth grades mathematics classes.Prior to beginning the study, it was assumed that the students in the study would not fully

embrace the incorporation of self-regulated learning strategies into their regular instruction if they saw it as an imposition. The idea was to choose strategies that were valuable and could be utilized as a seamless component of the regular content instruction.

The experimental group consisted of all of the ninth grade mathematics students at a secondary school. The following strategies were most appropriate for secondary school mathematics students and used at the treatment period:

- Using an organized, interactive note-taking method such as the Cornell method.
- Teaching students an active study method that focused on strategies that are interactive, proactive and productive.
- Working with students to enhance their abilities to articulate their processes, steps and thoughts as they are solving problems.
- Helping students to develop a process for error analysis.
- Developing methods that assist students with checking their work and solutions as a component of problem solving.
- Teaching students to identify specific short term goals with self-determined consequences and rewards.
- Helping students to analyze problem characteristics to identify the types of items that would be most appropriate for assessment purposes.
- Helping students to effectively use the resources provided in the mathematics textbook.
- Teaching students test review strategies.
- Assisting students with how, when and from whom they should seek help when they are not sure of how to solve a problem.