4.1. Introduction

Research methodology is a way to systematically solve the research problem. It may be understood as a science of studying how research is done scientifically. It is essential that the researcher must have sufficient knowledge both on methods and methodologies. Methodology helps the researcher to decide about the techniques to be utilized or applied in the study, because, certain techniques and procedures are applicable only to certain problems. Thus, it is necessary for the researcher to design the methodology for the particular problem very carefully. The scope of research methodology is wider than that of research methods. Thus, when we talk of research methodology, we not only consider research, but also the logic behind the methods we use in the context of our research study and explain why we are using a particular method or technique and why we are not using others, so that research results are capable of being evaluated either by the researcher himself or by others (Kothari, 1985).
This chapter deals with the methodology followed in this study. A systematic methodology is a must for any research investigation not only to analyse the problems properly but also to arrive at dependable and reliable conclusions. The methodology is a touchstone to assess whether the researcher has followed scientific procedures in his investigation. A clear-cut methodology will guide the investigation in the right direction without any deviation or distraction and haphazardness (Best and Khan (2007). So the investigator took utmost care to follow a scientific methodology in this investigation.

The methodology followed in this study is discussed under different headings namely construction of separate rating scales for assessing the awareness of the teachers and the students about the metacognitive strategies, construction of achievement test, selecting samples and sample design, application of the metacognitive strategies to teach English to the Xth standard students, data collection and finally the statistical techniques used in the study for arriving at dependable conclusions. The studies of Abdelhafez (2006), Anthony (1999) and Susan (2002) provided guidelines for selection of method, tool and appropriate statistical techniques and analysis.

4.2. Selection of Model for Metacognitive Teaching Learning Strategy

Metacognitive strategies are actions which go beyond cognitive devices and which provide a way for the learners to coordinate and to regulate their own learning process. Ormrod (1995) examined several learning and metacognitive strategies that appear to promote effective learning and retention of classroom material and identified the following:

- Being aware of one’s own learning and memory capabilities and what learning tasks can realistically be accomplished.
- Knowing which learning strategies are effective and which are not.
- Planning an approach to a learning task that is likely to be successful.
- Monitoring one’s present knowledge state.
- Knowing effective strategies for retrieval of previously stored information.
The procedures of metacognitive instructional strategies vary from scholar to scholar. According to Jahitha Begam (2007) metacognitive strategies include planning, focussing attention, information management, memory, monitoring and evaluation. The cognitive modelling approach followed by Balasubramanian and Mohan (1997) includes activities such as focussing attention, information gathering, remembering, organising, analysing, generating and integrating.

According to Vockell (2007) the following skills outline metacognition for learners:
1) They must be able to monitor their cognitive processes.
2) They must resist using primitive strategies that superficially seem to get the job done.
3) They must have an adequate knowledge base.
4) They must set goals and make attributions that support the use of cognitive strategies.
5) They must transfer thinking strategies to new situations in which they would be appropriate.

To deliver strategies that will address metacognitive skills Vockell (2007) lays down the following procedures i.e. self monitoring cognitive processes, developing successful techniques, assessing requisite knowledge, setting goals and adopting cognitive strategies and transferring strategies to new situations. The model given by Neil J. Anderson consists of five components. This model includes the procedures such as 1) preparing and planning for learning 2) selecting and using learning strategies 3) monitoring strategy use 4) orchestrating various strategies, and 5) evaluation of strategy use and learning. As far as this study is concerned, the model of Neil. J. Anderson is followed to assess the efficacy of metacognitive instructional strategy on the achievement of various categories of students in English at secondary level.
i) **Preparing and planning for learning**

Preparing and planning is very essential for any task. Well planned work is half done work. It ensures active participation, involvement commitment and better understanding. This preparedness or readiness provides the required mindset for learning.

ii) **Selecting and using learning strategies**

This step induces the learners to try on his own to think of the strategies that can be applied to learn the concept. They think of strategies and they try to analyse the relevance and viability of the strategy and whether they will feel comfortable with the strategy. From the various strategies available or known to them the learners select a specific strategy which they feel they can confidently use. This makes the learners more responsible and more accountable for their own learning. Since the selection of the strategy is their choice, they are able to use the strategy with ease. This enhances their level of confidence and competence.

iii) **Monitoring strategy use**

The students monitor the strategy selected by them. This gives them an insight into how the strategy works, whether there is any inadequacy and whether the strategy can be finally selected to learn all the units. Also, they are able to assess whether the strategy applied is effective in learning all the skills of language learning and whether the efficacy is consistent with reference to various skills and various language items i.e. prose, poetry, grammar etc.

iv) **Orchestrating various strategies**

This provides an insight to the students to understand where the lacuna is. This makes them think of applying alternative strategies to achieve their objectives. This broadens their knowledge about various strategies. Besides, this procedure enhances and strengthens their application skill.

v) **Evaluating strategy use**

This is the concluding step. They evaluate the efficacy of the strategy. They are able to assess the adequacy or the inadequacy of the strategy. The entire procedure enables the students to develop a clear perception of how to identify the right type of strategy and how to apply the strategy effectively for optimum learning. Thus the students learn how to learn.
4.3. Construction of Research Tools

The outcome of the research work purely depends upon the quality of data used for the study. The collection of data is normally done by using appropriate research tool / tools. The tool in a research is a broader term which normally includes achievement test, questionnaire, interview schedules, rating scale, check list etc. The selection of the relevant tool plays a vital role in determining the quality of data which is needed to arrive at right conclusion. To select appropriate tool the investigator should consider various aspects and nature of the problem, sample design, resource and time.

4.3.1. Construction of Rating Scale

There are many tools used to collect data for any research work. John W. Best (1977) says ‘like the tools in the carpenter’s chest, each tool is appropriate in a given situation’. A rating scale consisting of 50 items was constructed to assess the awareness of teachers about the metacognitive strategies. The items in the rating scale were based on the principles and procedures of metacognitive strategies. Similarly, a separate rating scale was constructed to assess the awareness of the students about the metacognitive strategies. The items in the students rating scale were also based on principles, procedures and the practices of metacognitive strategies. The main purpose of the checklist was to assess the strength and weakness of the students and to assess the status of the teachers regarding the application of metacognitive strategies in the actual classroom practices. Three point scale was followed in the construction of rating scale.

In the present study, to assess the awareness of students and teachers about the metacognitive strategies, a checklist consisting of twenty statements relating to the principles and procedures of
metacognitive strategies was developed by the investigator. First a pool of 25 items was constructed by the investigator. The statements were culled out from the theoretical expositions given by various authors. And the first draft of the checklist was prepared with twenty five items each specifying a specific principle or procedure. On the basis of the response of the students and teachers in the pilot study, five statements that were either ambiguous or difficult to understand were deleted from the rating scale. The final form of checklist contained 20 items. Ten items were related to the concept of metacognition and 10 items were related to MTLS strategies. This rating scale was administered to 10 teachers and students for pilot study. On the basis of the scores obtained in the pilot study, reliability of the checklist was established by using split-half method. The half test reliability (0.99) and the whole test reliability (0.99) obtained through split-half method is high and hence, the MTLS awareness checklist used in the study is reliable.

The validity of the checklist was obtained from a panel of experts who have done research in the field of metacognition. They testified to the content and construct validity of the checklist. Their agreement was taken as the index of validity of the rating scale.

The developed checklist was given to the teachers to answer for each of the twenty items given in the checklist. Similarly, Tamil version checklist was administered to the students who were also required to answer all the twenty items given in the checklist. Both the teachers and the students were instructed by the investigator to be free, frank and truthful so that the data obtained can be reliable and accurate assessment can be made for the purpose of research. The served checklists are given in Appendices I and II. The awareness scores were useful to assess the level of awareness of students and teachers about metacognitive strategies before and after the experimental treatment.
4.3.2. Construction of Achievement of Test

Achievement tests attempt to measure what an individual has learned and his or her present level of performance. Most tests used in schools are achievement tests. They are particularly helpful in determining individual or group status in academic learning. Achievement test scores are used in placing, advancing, or retaining students at particular grade levels. They are used in diagnosing strengths and weaknesses and serve as a basis for awarding prizes, scholarships, or degrees. Many of the achievement tests used in schools are non-standardized, teacher-designed tests. School districts, however, often use standardized tests to compare schools and school districts.

In research, achievement test scores are used frequently in evaluating the influences of courses of study, teachers, teaching methods, and other factors considered to be significant in educational practice. In using tests for evaluative purposes, researchers must remember not to generalize beyond the specific elements measured. For example, to identify effective teaching exclusively with limited products measured by the ordinary achievement test would be to define effective teaching too narrowly. It is essential that researchers recognize that the elements of a situation under appraisal need to be evaluated on the basis of a number of criteria, not merely on a few limited aspects.

To evaluate the effectiveness of the metacognitive strategy and to compare the achievement of the experimental group students taught through metacognitive strategy, an achievement test was framed. The test was framed covering all the units in the Xth English Reader.

**Construction Procedure**

Questions of objective type nature were framed covering all the units. Multiple choice, fill in the blanks, true or false and match the following were
the types of questions used in this achievement test. As there are more chances for variations evaluation in subjective type questions, only objective type questions have been used for the purpose of this study. The questions were framed so as to suit the level of Xth standard students. Utmost care was taken to avoid ambiguity and ambivalence. The items included in the final form of achievement test were selected on the basis of item analysis.

Initially, 120 questions of objective type in nature were framed for try outs. Forty percent multiple choice test items, 30 percent fill in the blanks or supply test items, 10 percent true or false test items and 20 percent matching type test items were framed for the achievement test. Multiple choice test items were composed of a stem followed by a series of possible responses or options. The stem was a direct question or an incomplete statement with four options of which only one was the correct response. Due importance and weightage, the investigator had given to multiple choice test items because its level of difficulty can be varied with relative ease, and it is capable of reflecting simple student behavioural patterns such as recall of information as well as complex student behavioural patterns such as the ability to analyse and synthesise.

Supply test item or fill in the blanks test items constituted 30% test items. These test items were questions or incomplete statements which required highly short and specific answers. The answer was usually a significant word or expression. Matching test items constitute 20% of test items. Matching test items consisted of two lists of items and a set of instructions for matching one of the items in the first list with one of the items in the second list and true or false test items accounted for 10% of the test items.
Item Analysis

After this pool of 120 test items was constructed, the framed test items were subjected to careful scrutiny and critical judgments by a panel of subject experts. Each item was critically examined for what might be termed ‘formal defects’. The next stage was that this was given as a test to 20 students belonging to the target population. The obtained data were then used for an elaborate set of statistical procedures known as item analysis which gave the investigator information regarding.

1. Item difficulty
2. Item discrimination

Item Difficulty

Test item difficulty refers to the percentage of students who correctly answer to a given test item. The level of difficulty was determined by using the formula

\[ P = \left( \frac{N_r}{N_t} \right) \times 100 \]

Where

- \( P \) – percentage of students who answered the test item correctly
- \( N_r \) – number of students who answered the test item correctly
- \( N_t \) – total number of students who attempted to answer the test item

In most of the cases the percentage clustered about the 50 percent level. On the basis of this analysis, too easy and too difficult test items were deleted in the final form of achievement test.

Item Discriminating Power

A test item is said to possess adequate discriminating power when it is capable of differentiating between superior and inferior students. To determine item discriminating power, the following simple formula was used even though there are many different computational schemes.

\[ D = \frac{(U - L)}{N} \]

\( D = \) index of item discriminating power
U = Number of students in the upper group who answer the test items correctly (usually 27% of the total group)
L = Number of students in the lower group who answer the test items correctly (usually 27% of the total group)
N = Number of students in each group

For more than 50% of the test items, the computed ‘D’ value exceeded 0.40 which indicated that the test items were good and for the remaining items, the computed ‘D’ value ranged between +0.40 and +0.20 which was a clear indication to the satisfactory condition of the test item. Those items which failed to differentiate between the superior and the inferior students were not included in the final form of achievement test.
The P-value and D-value for each of the 120 test items in the initial form of achievement test were calculated and they are given in appendix–III. The final form of achievement test is given in appendix–IV.

Each item was scored ‘one’ mark for the correct response and ‘zero for the wrong response. The duration of the test was 2 hours. The same achievement test was used as pre – test, post - test and retention test in the study.

The test was administered to twenty students belonging to the target population. The main purpose of the testing was to establish the reliability of the achievement test. The test scores obtained from the students formed the basis for establishing the reliability of the test.

4.3.3. Reliability of the Tool

A test is reliable to the extent that it measures whatever it is measuring consistently. In tests that have a high coefficient of reliability, errors of measurement have been reduced to a minimum. Reliable tests are stable in whatever they measure and yield comparable scores on repeated administration. An unreliable test is comparable to a stretchable rubber yardstick that yields different measurements each time it is applied.
The test reliability means the consistency with which a set of test scores measures what they do measure (Ebel, 1975). It relates to the accuracy with which skill and knowledge are measured (Slavin, 1987). Reliability is a necessary condition for validity. Reliability co-efficient provides the most revealing statistical index of validity that is ordinarily available.

There are different methods to estimate the reliability of a test. Some of the commonly used methods are:

1. Test – retest reliability
2. Split-half reliability
3. Alternative or parallel form reliability
4. Kuder-Richardson Estimates

In the present study, the split-half method is used to estimate the reliability of the test. The split-half method is considered to be one of the best methods for measuring the reliability, because all the data for computing reliability are obtained by one testing. Also, the variations likely to be brought about by difference between the two testing situations are eliminated.

In this method, the test items were divided into two equivalent halves by pooling the scores on odd numbered items and pooling the scores on even numbered items and the correlation was found for these half tests by using the Karl Pearson’s correlation coefficient formula,

\[
r = \frac{N \sum XY - \sum X \sum Y}{\sqrt{(N \sum X^2 - (\sum X)^2) (N \sum Y^2 - (\sum Y)^2)}}
\]

\[
r = \frac{(20 \times 9894 - (431 \times 434)}{\sqrt{[(20 \times 9987) - 185761)] [(20 \times 10096) - 188356]}}
\]

\[
= \frac{197880 - 187054}{\sqrt{(199740 - 185761) (201920 - 188356)}}
\]
\[
\frac{10826}{\sqrt{(13979) (13564)}} = 0.78
\]

From the reliability of half test correlation, the self correlation of the whole test is then estimated by using Spearman – Brown’s prophecy formula

\[
\frac{2\text{roe}}{1 + \text{roe}} = \frac{2 \times 0.78}{1 + 0.78} = 1.56
\]

\[
\frac{1.56}{1.78} = 0.88
\]

\[r_{xx} = 0.88\]

Where, \(r_{xx}\) – coefficient of internal consistency

\(r_{oe}\) – coefficient of correlation between the odd half scores and even half scores.

(The obtained \(r_{xx}\) value (0.88) indicates that coefficient of internal consistency is high and positive).

The obtained value 0.88 shows that the achievement test used in the study is highly reliable.

4.3.4. Validity of the Tool

Validity is the quality of the research tool or procedure that measures what it purports to measure. According to John W Best (1989) “Validity is the quality of a data gathering instrument or procedure that enables it to measure what is supposed to measure”.

The index of reliability is sometimes taken as a measure of validity (Garrett. E. Henry and Wordsworth, 1981). Several kinds of validity are ascertained. They are:
(i) Content Validity

Content validity indicates how adequate is the content of a test about which inferences are to be made. The items of the rating scale are based on the review of related literature and consultation with field experts in the subject area. Their suggestions have been taken into account to enhance the content and quality of items. In view of the procedure adopted in selection and refinement of items, it can be said that the research tools used in the study possess content validity.

(ii) Face Validity

This term is used to characterize test materials that appear to measure what the investigator desires to measure. That is, the test contains items that seem to be related to the variable being measured. The investigator assured that by the opinion of the experts who are familiar with test development. Hence, the achievement test used in the study has face validity.

(iii) Intrinsic Validity

Intrinsic validity refers to how well the obtained scores measure the test true score components. Square root of the reliability value of the scale is its intrinsic validity. The obtained intrinsic validity of the Achievement test (0.98), is high indicating the intrinsic validity of the test used in the study.

From the above discussion it can be understood that a research tool is said to be valid when it measures what it purports to measure. Any achievement test should possess validity. Validity indicates how adequately the content of the test is sampling that domain about which inferences are to be made. It is particularly very important for achievement tests. A logical examination of instructional objectives and the content to be taught was done by panel experts. The panel consisted of two professors from Education, one professor from Rajapalayam Raju’s college and four
noteworthy P.G. Assistants of Rajapalayam taluk, in addition to the P.G. Assistants serving in the school where the experiment was carried out. The agreement of the views of the ten experts was taken as the index of validity of the content of the achievement test.

4.4. Identifying Various Categories of Students

A teacher must be able to identify various categories of students to make his teaching task a successful one. Identifying the various categories is very essential for a teacher to know about their level of academic achievement, to classify them into appropriate category, to make correct assessment and placement and to decide upon the appropriate instructional strategy. In this study, various categories of students were identified on the basis of curriculum based assessment.

4.4.1. Curriculum Based Assessment

Curriculum based assessment is the process of determining instructional needs by directly assessing specific curriculum skills (Choate et al., 1992). The term curriculum based assessment is a technique that measures students achievement in the curriculum (Bursuck and Lessen, 1987; Gickling, 1981 and Tucker, 1987). It is defined as any approach that uses direct observation and recording of a student’s performance in local school curriculum as a basis for gathering information to make instructional decision (Deno, 1987, p. 41). Gickling and associates pioneered the current movement of tying the assessment directly to the curricula (Shinn, 1989) and are credited with first using the term ‘curriculum-based assessment’ (Tucker, 1985).

Advantages of Curriculum based Assessment

i) Curriculum-based assessment is very useful at all levels of the assessment process from initial screening to programme evaluation. For the purpose of screening and referral, curriculum – based assessment
provides systematic observational data concerning students’ performance, measures the degree of deviance from peer performance and provides information for instructional intervention that would either legitimise or correct the need for the referral. When making referrals, general education using curriculum based assessment measures is able to specify skill deficits (Blankenship and Lilly, 1981). In short, curriculum based assessment would cure the palpable illegalities presently afflicting the subjective referral systems operating nation-wide (Galagan, 1985).

ii) Curriculum based measurement, which is one type of curriculum –based assessment, has been found to be an effective tool for identifying students with special needs (Deno, 1987; Galagan, 1985; Germann & Tindal, 1985; Jenkins et al., 1979; Marston & Magnusson, 1985 and Marrston et al., 1984).

A curriculum based assessment of the students brings to light the level of achievement of the students. This curriculum based assessment was made with the help of the concerned class teacher who spends most of the time with those students, by direct observation and by scrutiny of relevant school records. This type of curriculum based assessment provides a detailed description of the child in the school setting, giving information about eight factors.

1. The child’s level of attainment in the basic subjects in terms of what he can do and what his special difficulties appear to be.
2. The child’s level of language development and speech.
3. Standards of achievement in other areas of curriculum, e.g., art, practical subject, physical education.
4. Emotional and social behaviour as displayed both in and out of the classroom.
5. Interest in and attitude towards school.
6. Previous school history.

7. The child’s interest and background knowledge.

8. Degree of parental co-operation and parental control.

By making a curriculum-based assessment of the target population by observation techniques as well as by scrutiny of records, which gave a subtle insight into the students’ capacity and achievement, about 30 students each were identified from rural and urban schools. This pool of 30 students consisted of ten above average students, ten average students and ten below average students.

4.5. Sample of the Study

The primary purpose of a research is to discover principles that have universal application, but to study a whole population to arrive at generalizations would be impracticable, if not impossible. Some populations are so large that their characteristics cannot be measured; before the measurement could be completed, the populations would have changed.

A population is any group of individuals who have one or more characteristics in common that are of interest to the researcher. The population may be all the individuals of a particular type or a more restricted part of that group. All public school teachers, all male secondary school teachers, all elementary school teachers, or all the kindergarten teachers may be populations.

A sample is a small proportion of a population selected for observation and analysis. By observing the characteristics of the sample, one can make certain inferences about the characteristics of the population from which it is drawn. Contrary to some popular opinion, samples are not selected haphazardly; they are chosen in a systematically random way so that chance or the operation of probability can be utilized.
For the purpose of the experiment 60 students studying in Xth standard in St. Joseph Higher Secondary School, Dindigul were selected. They were selected on the basis of systematic purposive random sampling techniques. These students were divided into two equal halves to constitute the control group and the experimental group. Thirty students formed the control group and the remaining thirty students constituted the experimental group. These students were selected to represent the urban population. Similarly 60 students were selected from S.S.H.N. Higher Secondary School, Muhavur to represent the rural population. These 60 students also were grouped into two groups such as control group and experimental group. In the rural groups also, there were 10 students in each category. Experimental groups were taught through the metacognitive teaching learning strategies and the control groups were taught through the traditional lecture method.

Formal permission was obtained from the school authorities / headmasters to use the students selected from class X and the classrooms for the purpose of this experiment during the experimental period before starting the research work.

4.5.1. Procedure for Equating the Groups

The sample of 60 students was divided into two groups of 30 students each. Both the groups were equated as nearly as possible in terms of their achievement scores in the quarterly examination. Students having the same range of marks in the quarterly examination were equally and randomly allotted for experimental group and control group. To find out whether the control group and the experimental group were matched ones or not, mean and standard deviation were calculated for the scores obtained in the quarterly examination by each group. Then t-tests were applied to the scores of the control groups and the experimental groups. The obtained t-values (0.43, 0.37) were found to be not significant at 0.05 level. Hence, both the groups were matched ones in both rural and urban
schools in terms of their achievement before the inception of the experimental study.

Also t-test was applied to the pre-test scores to verify, whether these groups were matched ones. The obtained t-values (rural school 0.02, urban school 0.06) was not significant at 0.01 level. Thus, all the t-values revealed that both the groups were matched ones before the inception of experimentation.

4.6. Design of the Study

This study is basically an experimental study with two group design. Experimentation provides a method of hypothesis testing. After experimenters define a problem, they propose a tentative answer or hypothesis. They test the hypothesis and confirm or refute it in the light of the controlled variable relationship that they have observed. It is important to note that the confirmation or rejection of the hypothesis is stated in terms of probability rather than certainty.

Although the experimental method finds its greatest utility in the laboratory, it has been effectively applied in nonlaboratory settings such as the classroom, where significant factors or variables can be controlled to some degree. The immediate purpose of experimentation is to predict events in the experimental setting. The ultimate purpose is to generalize the variable relationships so that they may be applied outside the laboratory to a wider population of interest.

In this study, a control group and an experimental group were formed for the purpose of experimentation. They were matched ones before the experiment. The control groups were taught through the traditional lecture method and the experimental groups were taught through metacognitive strategy. Both the groups were administered with an achievement test. The same achievement test was used in the pre-test and post-test to assess the performance of the students and to measure the effectiveness of the
applied strategy. Any strategy without retentive effect is of no use. Hence to assess the efficacy of the strategy in term of retention, a retention test was also administered to all the groups. The retention scores were useful to assess the retentive effect of the strategy with reference to various groups.

4.7. Applying Metacognitive Teaching Learning Strategy

The metacognitive teaching learning strategy was applied to teach English to the selected students in the experimental group. While the students in the control groups continued to learn English through the traditional method, the experimental group students were taught through the metacognitive strategy. For each prose or poetry the students were apprised how to regulate self study, how to monitor their progress and how to make a self evaluation of the study and progress. The same procedure was followed in teaching of English grammar. Once they were given guidance as to how to self regulate their study through activities suggested by the teacher, they were able to make self study to some extent. but as time progressed from first term to the last term, they were able to make study on their own to a considerable extent. Once they were able to self regulate their study, they were able to monitor their study and progress. This finally led to a smooth self evaluation. The metacognitive strategy applied to them for a period of one academic year brought about a complete change in the learning rate and the learning style of the students in the experimental groups, which was very desirable.
4.8. **Data Collection**

At the end of the experimental period, a post-test was conducted to the students of all the groups in both rural and urban schools. The responses given by the various categories of students in the pre-test, post-test and retention test formed the vital data required for analysis. The scores of the students in the pre-test, post-test and retention test are given in appendices VI and VII.

4.9. **Scoring Procedure**

The achievement test consists of 100 objective type questions. The total score of the test is 100. For correct answer, the score is one and for wrong answer the score is zero. The key to the achievement test is given in appendix V. The checklist had three options i.e. completely aware, aware to some extent and unaware having the scores 3, 2 and 1 respectively.

4.10. **Statistical Techniques Used in the Study**

Statistics is a body of mathematical techniques or processes for gathering, organizing, analyzing, and interpreting numerical data. Because most of the research yields such quantitative data, statistics is a basic tool of measurement, evaluation, and research.

The word statistics is sometimes used to describe the numerical data gathered. Statistical data describe group behavior or group characteristics abstracted from a number of individual observations that are combined to make generalizations possible.

Research consists of systematic observation and description of the characteristics or properties of objects or events for the purpose of discovering relationships between variables. The ultimate purpose is to develop generalizations that may be used to explain the phenomena and to
predict future occurrences. To conduct research one must establish principles so that the observation and description have a commonly understood meaning. Measurement is the most precise and universally accepted process of description, assigning quantitative values to the properties of objects and events.

The data obtained were analysed by using appropriate statistical techniques such as mean, standard deviation and t-test. At the first stage mean and standard deviation of the pre-test scores were calculated for each group. Then to know the effectiveness of the metacognitive strategy in enhancing the achievement of students in English, mean and standard deviation of the post-test scores were calculated. Based on the mean and S.D., t-test was applied to know the significant differences between the means.

The obtained results are tabulated and the details of analysis and interpretation are presented in the succeeding chapter.