CHAPTER - III

METHOD OF INVESTIGATION
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3.1 INTRODUCTION

The procedure adopted by the researcher for the investigation is known as methodology. Methodology is an important aspect of any kind of research work.

Research design is the blue print of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose. In fact, the research design is the conceptual structure within which the research is conducted; it constitutes the blue print for collection, measurement and analysis of data.

As such the design includes an outline of what the researcher will do from writing the hypotheses and its operational implications to the final analysis of data. Research design is very much required since it facilitates the smooth sailing of the various research operations, thereby making research as efficient as possible, yielding maximal information with minimal expenditure of effort, time and money. Thus, a research design is very essential for any research project.

Research design explains the advanced planning of the method which can be adopted for collecting the relevant data and techniques to be used in their analysis. Keeping in view the objective of the research and the availability of staff, time and money, preparation for the research design should be done with great care as any error in it may upset the entire project.
Research design in fact, has a great bearing on the reliability of the results arrived at end as such constitutes the firm foundation of the entire structure of the research work. Design helps the researcher to organize his ideas in a form whereby it will be possible for him to look for flaws and inadequacies. Such a design can ever be given to others for their comments and critical evaluation.

The present chapter reveals with the formulation of hypotheses and the description of the method includes sample characteristics, Research Instruments employed and procedure adopted for investigation.

3.2 STATEMENT OF THE PROBLEM

A number of studies have been conducted the results are not found to be conclusive in determining the most important factors that report for the variations observed in the academic performances of students, especially at the secondary level and thus the variable, academic achievement is found to be important to be analyzed in the field of education.

There has been considerable debate regarding the causal precedence of intelligence and academic achievement. Some researchers view intelligence and achievement as identical constructs. Others believe that the relationship between intelligence and achievement is reciprocal. Still others assert that intelligence is causally related to achievement.

Despite the importance that is often ascribed to motivation in school contexts, only a few studies have so far investigated the incremental validity of motivation above and beyond general intelligence. This has necessitated further research investigating achievement motivation and academic achievement of students.
School factors interact with the teacher factors to make complex relationships affecting student achievement; class size has continued to be a controversial topic in the research regarding its impact on student achievement (Hattie, 2005); and the leadership of the school also indirectly impacts student achievement (Heck, Larsen, and Marcoulides, 1990).

Understanding classroom climate variables will allow for professional development for teachers to focus on areas to increase student achievement has necessitated further investigation of the influence of classroom climate on the academic achievement of students.

Studies have attempted to study socio-economic status correlates academic achievement. Few studies have found boys performing better than girls (Hota, 1995; Muhkerjee, 1997), a few others found girls doing better than boys (Paria 1996; Pal and Natarajan, 1997), while a few studies did not find any difference between boys and girls (Wangu and Thomas, 1995; Nagalakshmi, 1996; Chakrabarti, 2000).

The results of previous studies necessitated further investigation of the significant influence of socio-economic status on the academic achievement of students.

Various factors have been adduced for poor performance of students in academics. The interest of students in academics have been related to the volume of work completed, students task orientation and skill acquisition, students personality and self-concept (More, 1973), feeling of inadequacy (Callaham, 1971), motivation and self-confidence (Aiken, 1976), anxiety (Aiken, 1970), shortage of qualified teachers, (Ohuche 1978, Ale, 1989), poor facilities, equipment and instructional

Other research findings have shown that individual students’ characteristics variables such as motivational orientations, self-esteem and learning approaches are important factors influencing academic achievements. In the effort to improve students cognition and affective outcomes in school learning, educational psychologists and educators, have continued to search for variables (personal and environmental) that could be manipulated in favour of academic gains.

The review done from the available relevant literature, relating to the present research area, led the investigator to conceptualize the problem in an attempt to fill in the lacunae found.

Thus the problem is stated as here under:

Influence of Personal and Environmental Factors on Academic Achievement of Students at the Secondary level

The problem thus stated warrants formulation of hypotheses.

3.3 HYPOTHESES WITH REFERENCE TO RELATIONSHIPS

The present investigation involves a number of independent variables and one dependent variable. This necessitated multivariate directional hypotheses in order to establish relationship between intelligence, achievement motivation, classroom climate, socio-economic status and academic achievement of students at the
secondary level in different categories of schools. Several studies have indicated definite directional influence of intelligence, achievement motivation, classroom climate, socio-economic status and academic achievement of students. As the nature of relationship between these variables seems complex it is decided that abundant caution will be exercised in formulating hypotheses. The direction of these relationships is definite as shown in the earlier studies (Jaffe, 1985; Wang and others, 1992; Abousire, 1995; Ackerman, 1996; Fraser, 1998; Rani, 1998; Frieberg, 1999; Schaefer Barbara and McDermott, 1999; Juarez, 2000; Fontayne, Sarrazin and Famose, 2001; Kalyani, 2002; Kuncel and others, 2004; Simon, 2004; Franzis and others, 2006; Ilirjan, 2013, Anitha, 2013; Alwan and others, 2013; Indhumathi, 2014; Archana and Chamundeswari, 2014) and directional multivariate hypotheses are extrapolated and presented below:

I. Academic achievement will be significantly related to intelligence, achievement motivation, classroom climate and socio-economic status of students at the secondary level in different categories of schools, namely, Government, Government Aided and Private schools

The above multivariate hypotheses is split into several sub hypotheses for simplification and clarity and presented here under:

II. There will be a significant and positive relationship between intelligence and academic achievement of students at the secondary level in different categories of schools, Government, Government Aided and Private schools
III. There will be a significant and positive relationship between achievement motivation and academic achievement of students at the secondary level in different categories of Government, Government Aided and Private schools

IV. There will be a significant and positive relationship between classroom climate and academic achievement of students at the secondary level in different categories of schools, namely, Government, Government Aided and Private schools

V. There will be a significant and positive relationship between socio-economic status and academic achievement of students at the secondary level in different categories of schools, namely, Government, Government Aided and Private schools

3.4 HYPOTHESES WITH REFERENCE TO DIFFERENCES

The present study aims to investigate the possibility of variance existing among students on the selected variables of study based on certain home and school conditions. As it was found that there are contradictory inferences and inconclusive findings reported in the literature, a clear direction with regard to difference could not be elicited. The Indian research report indicated a dearth of information due to limited number of studies and even those sporadic studies do not manifest any clear cut direction. Hence the present study is a pioneering exploration on comparison of students along the selected variables with varying psychological and sociological conditions.
These facts have led the investigator to formulate null hypotheses with regard to comparison of students. The null hypotheses thus formulated are presented below:

I. There will be no significant difference in academic achievement among students at the secondary level in different categories of schools, namely, Government, Government Aided and Private schools

II. There will be no significant difference in intelligence of students at the secondary level in different categories of schools, namely, Government, Government Aided and Private schools

III. There will be no significant difference in achievement motivation of students at the secondary level in different categories of schools, namely, Government, Government Aided and Private schools

IV. There will be no significant difference in classroom climate of students at the secondary level in different categories of schools, namely, Government, Government Aided and Private schools

V. There will be no significant difference in socio-economic status among students at the secondary level in different categories of schools, namely, Government, Government Aided and Private schools

3.5 METHOD OF INVESTIGATION

The investigator took ultimate care to execute a sound research methodology, designing the psychometric properties and establishing the same to the sample.
The present section provides a detailed description of the variables studied and controlled, the sample selected, research instruments chosen and description of the main study. The investigator has used survey method.

3.6 RESEARCH DESIGN

The present study deals with the analyses of variables, intelligence, achievement motivation, classroom climate, socio-economic status and achievement of students at the secondary level in different categories of schools, namely, Government, Government Aided and the Private schools.

Therefore a factorial design was chosen to be most appropriate to verify hypotheses. A factorial design is one in which more than two independent variables are juxtaposed in order to study the effect on the dependent variable (Kerlinger, 1983).

Thus the present study draws a 3 x 2 factorial correlated groups design system in nature. This is Descriptive Survey Research.
3.7 INDEPENDENT AND DEPENDENT VARIABLES

The variables chosen for the present study is divided into dependent, independent variables (McGuigas, 1978).

1. Dependent Variable;
   (i) Academic Achievement

2. Independent Variables;

Independent variables grouped into Personal Factors and Environmental Factors.
Personal Factors:

(i) Intelligence

(ii) Achievement Motivation

Environmental Factors:

(i) Classroom Climate

(ii) Socio-economic Status

3. Category of Schools

(i) Category of Schools
   - Government Schools
   - Government Aided Schools
   - Private Schools

4. Gender of Students

(i) Gender of Students
   - Boy
   - Girl

3.8 POPULATION AND SAMPLE SELECTED FOR STUDY

The present study is intended for students belonging to the city of Chennai, the capital of Tamilnadu state. It is interesting for an educator to observe the multiple variances in the Indian system of school education. Depending on the system of education it is decided whether the school will be fully owned Government, supported by the State Government or self-financed.
The existence of multiple schools with multiple systems of education becomes predetermined. This condition has led the investigator to take into account the entire list of schools inclusive of most of the systems prevailing in the district of Chennai, within the geographic locations politically determined.

It is understood that the district consists of four important geographic locations, namely, North, South, East and Central zones. It was also known that the numbers of schools were not equally distributed on the basis of the number of people living in the locale. However, a systematic randomization of selection of schools was done in order to control sampling errors and have a systematic variance.

In this study, the investigator refers it as the Students studying in Indian schools belongs to several categories. For the present study the Investigator, selected three categories of school students in which students are studying prevailing in Chennai district of Tamilnadu.

1. Government schools
2. Government Aided schools
3. Private schools

Government schools are fully owned by the State Government, following Samacheer syllabus framed by the State Government.

The government-aided schools, though follows the same samacheer syllabus as the government schools are governed by a private management but get aid from the State Government to pay the teaching and non-teaching staff.
The private schools totally governed by a private management do not get any sort of a support or aid from the State Government, but follow the same samacheer syllabus like the government and government-aided schools.

Here the investigator has considered two strata i.e. Type of school management and gender of the student. The investigator planned to collect the data from Government, Government Aided and Private Schools male and female students.

In the present study the investigator planned to analyse 3X2 factorial design. Therefore the investigator applies the Stratified Random Sampling technic for the selection of samples.

**Table - 1**

**Sample Distribution**

<table>
<thead>
<tr>
<th></th>
<th>Government School</th>
<th>Government Aided School</th>
<th>Private Schools</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boys</td>
<td>160</td>
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<td>153</td>
<td>478</td>
</tr>
<tr>
<td>Girls</td>
<td>159</td>
<td>150</td>
<td>162</td>
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</tr>
<tr>
<td>Total</td>
<td>319</td>
<td>315</td>
<td>315</td>
<td>949</td>
</tr>
</tbody>
</table>
Figure - 4

School-Wise Distribution of Sample
Figure - 5

Gender-Wise Distribution of Sample
3.9 Research Instrument Employed

The Research Instrument selected and constructed to be used for assessment of the variables are as follow:

1. Intelligence - A scale on Standard Progressive Matrices developed by Raven 1960
2. Achievement Motivation - A Scale on Achievement Motivation constructed and validated by the investigator G. Sundara murthy & Dr. D. Vinodh Kumar.
3. Classroom Climate - A Scale on Classroom Climate scale developed by Babu 1994.
4. Socio Economic Status - A Scale on Socio-economic Status adopted by the investigator which is developed by Srivastava 1991.

The research instruments chosen were found to be suitable, workable, reliable and valid. The need for construction arose as it was found that there were no suitable tests available for appropriate to the sample and locality to assess variable, achievement motivation. Thus, the assessment required construction of appropriate research instrument for the variable, achievement motivation.

3.10 Research Instrument Selected

The investigator chose five variables for the study. Out of that four variables assessed by the investigator directly. For the last variable Academic Achievement,
The investigator collected 9th Standard student’s Second Term exam marks taken as score, from the school authorities.

3.10.1. Standard Progressive Matrices developed by Raven 1960

Standard Progressive Matrices developed by Raven is considered to be the best and the constant standardized observation and thinking test for determining the intelligence of adolescent, so the investigator used the same for the purpose of their testing, the student’s knowledge and intelligence the non-verbal pictures create interest among students.

Progressive Matrices was constructed on the prior assumption that if spearman’s principles of neogenesis were correct, it should provide a test suitable for comparing students with respect to their immediate capacities for observation and clear thinking.

Reported investigations show how for and under what conditions this complementary test, provide a practical means of assessing a student’s intellectual development.

The Standard Progressive Matrices, Sets A, B, C, D and E is a test a student’s capacity at the time of the test to apprehend meaningless figures presented for their observation, see the relations between than conceive the nature of the figure, completing each system of relations presented, and by so doing, develops a systematic method of reasoning.

The scale consists of 60 problems divided into five sets of 12. In each set the first problem, is a nearly as possible self-evident. The problems which follow become progressively more difficult.
In order of the test provides the standard training in the method or working the five sets provide five progressive assessments of a student’s capacity for intellectual activity to ensure sustained interest and freedom from fatigue, the figures in each problem are boldly presented, accurately drawn and as for as possible, pleasing to look at, the scale is intended to cover the whole range of intellectual development from the time the child is able to group the idea of finding the missing piece to complete a pattern, and to be sufficiently long to assess a student’s maximum capacity to form comparisons and reason by analogy without being unduly exhaustive.

The scores obtained by students tend to cluster in the upper half of the scale but there are enough difficult problems to differentiate satisfactorily between them.

Everyone, whatever is their age, is given exactly the same series of problems in the same order and is asked to work at their own speed, without interruption, from the beginning to the end of the scale. As the order of the problem provides the standard training in the method of working, the scale can be given either as an individual, a self-administered or as a group test.

A student’s total score provides an index of his/her intellectual capacity whatever be his/her nationality or education. The contribution which each of the five sets makes to the total provides a means of assessing the consistency of the estimate and the psychological significance of discrepancies in the test results.

**Administration and Scoring**

At a stretch about 300 students at the high school level from different schools following different systems of education, namely, the Government, Government Aided and the Privates were instructed to complete the pattern, with the missing
piece. They were also directed to proceed as per the instruction given in Raven’s book.

**Expected Score on Each Set (for example)**

<table>
<thead>
<tr>
<th>Percentile</th>
<th>Points</th>
<th>8</th>
<th>8 ½</th>
<th>9</th>
<th>9 ½</th>
<th>10</th>
<th>10 ½</th>
<th>11</th>
<th>11 ½</th>
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</table>

The score consists of 60 problems divided into five sets of 12.

The researcher recorded the number of the piece pointed to in each test in the appropriate place on the record form.

A student’s score on the scale is the total number of problems solved correctly.

By subtracting from a student’s score on each of the five sets the score normally expected on each set for the same total score on the scale, the consistency of his/her work can be assessed.
3.10.2. Achievement Motivation Scale Constructed by G. Sundara murthy & Dr.D. Vinodh Kumar.

In the present investigation an appropriate research instrument is required to assess the achievement motivation of students in our Indian context. Motivation is generally regarded as the drive to achieve targets and the process to maintain the drive. Motivation provides an important foundation to complete cognitive behavior, such as planning, organization, decision-making, learning, and assessments (Pintrich & Schunk, 1996).

Spence and Helmreich (1983) defined achievements as task-oriented behavior. Performances of individuals are often compared against standards or with others for assessments. The differing perspectives of scholars result in various definitions of achievement motivation. The original definition of achievement motivation was from Atkinson (1964), who defined it as the comparison of performances with others and against certain standard activities.

Achievement Motivation Theory is one of a number of psychological theories concerning what makes people do what they do. Knowledge of this theory is useful to managers who wish to get the most out of their employees. The Theory of Achievement Motion attempts to account for the determinants of the direction, magnitude and persistence of behaviour, in limited but very important domain of human activities.

According to Dave and Anand (1979) achievement motivation is a desire to do well relative to some standard of excellence. Colman, (2001) defined achievement motivation as a social form of motivation involving a competitive desire to meet
standards of excellence. Thus, the basis of achievement motivation is achievement motive, i.e. motive to achieve. Those who engage themselves in a task account of an achievement motivation.

According to Expectancy-value Theory (Eccles and others, 1983; Eccles and Wigfield, 2002), expectations of success are a crucial component influencing achievement-related performance and are assumed to be influenced by perceptions of competence and by goals held by individuals. Such perceptions and goals are influenced by individuals’ interpretations of their own previous achievements.

In other words, expectations of success and outcomes of achievements presumably have a cyclical influence on each other. That is, individuals’ expectations of success influence their achievements and their achievements further influence their future expectations. Consistent with the feedback mechanism of the Expectancy-value Model, adolescents are expected to have better long-term academic achievement outcomes if they have higher educational expectations during earlier periods. Through feedback mechanisms operating over time, educational expectations are assumed to facilitate academic achievements.

Atkinson and Feather (1966) suggested that achievement motivation is a combination of two personality variables: tendency to approach success and tendency to avoid failure.

Bigge and Hunt (1980) defined achievement motivation as the drive to work with diligence and vitality, to constantly steer toward targets, to obtain dominance in challenging and difficult tasks and create sense of achievement as a result. This
definition consists of three elements: the stimulation of personal capabilities, constant efforts with drive and obtaining of sense of satisfaction.

Based on theories and previous researches, initially, 51 statements were prepared pertaining to three dimensions, stimulation of personal capabilities, constant efforts with drive and obtaining of sense of satisfaction. They were subjected to expert judgment where every item was required to be passed on its relevance to the content of achievement motivation of students.

Experts were requested to content validate the scale items. This was done with a view to establishing content validity of the scale items. On the basis of their opinion and comments 10 items had to be reframed and 11 were deleted for overall ambiguity.

The final Achievement Motivation Scale constructed by the investigator consists of 40 items on a Likert Scale with five alternatives, namely, Strongly Agree, Agree, Undecided, Disagree and Strongly Disagree. Further the research instrument is subjected to Confirmatory Factor Analysis for the purpose of standardization the final format of Achievement Motivation scale is administered with 30 student’s for the purpose of CFI. The Confirmatory Factor Index (CFI) is found to be 0.91, and thus the tool standardized.

Administration and Scoring

The test was administered as a group test for student. The investigator tested 10 students at a time belonging to secondary levels. The time taken to complete the test was 15 minutes and the subjects were comfortably seated and the following instructions were given.
“Listed below are a series of statements that tests the motivation of students.

Please read the following statements one by one carefully. Each statement can be responded in 5 alternatives viz., Strongly Agree, Agree, Undecided, Disagree and Strongly Disagree. According to your view, think and decide which alternative suits you well. Opening upon your decision, indicate the degree of your agreement or disagreement with each statements by marking a tick (✔) in front of each statements in the columns provided. There is no time limit, however, do not spend too much time pondering over a single item. I expect an honest response from you as it goes a long way in building research knowledge. Thank you”.

Most of students took 15 minutes to complete the test. The responses were collected and scored. The scoring is done as per the scoring scheme developed by the investigator.

Scoring is made on the basis of the 5 point rating scale of the Likert type and the scores for student’s motivation ranged from 40 to 200. Low scores indicated a low level of motivation and high scores indicated a high level of motivation. The ratings are presented as follows for every item.

1 - Strongly disagree
2 - Disagree
3 - Undecided
4 - Agree
5 - Strongly Agree
3.10.3. Classroom Climate Scale developed by Babu 1994

The Classroom Climate Questionnaire developed by Babu (1994) consists of 50 items intending to assess the classroom climate of students. In the questionnaire, out of the 50 items, there are 32 positive items and 18 negative items.

**Administration and Scoring**

Administration of the scale was simple and appropriate as the scale was precise and informative, intended to assess the classroom climate of students, encompassing 4 most important dimensions. The simplicity of the scale enabled the investigator to have a quick measure of the classroom climate of students in different category of schools, following different systems of education at the high school level. The heads of institutions and the teaching staff being extremely busy were co-operative in the organizing the students for data collection.

Scoring system was also simple involving a five-point rating scale. The ratings are presented as follows for every item.

1  -  Never  
2  -  Rarely  
3  -  Sometimes  
4  -  Often  
5  -  Always  

The scoring ranged from 50 to 250. A low score reflected on the low level of classroom climate perceived by the student and a high score reflected on the high level of classroom climate perceived by the students in different category of schools
at the high school level. The data thus collected from the heads of institutions were scored and subjected to statistical analysis.

3.10.4. Socio-economic Status Scale developed by Shrivastava 1991

For the present study, Socio-economic status Scale developed by Shrivatsava 1991 was selected to access the Socio-economic Status of the students. The tools were modified to suit present economic condition of the students.

The final form of the Socio-economic Scale (Shrivastava, 1991) seeks information’s about the following component variables:-

1. Education
2. Occupation
3. Income
4. Cultural living or Cultural standard
5. Social participation

Administration and Scoring

The research instrument was administered with the following instructions:

“Various possible alternatives of each question are given in this scale. Select only one alternative which suits you and put sign of multiplication ‘X’ in the square given against it. If fatherless, furnish information about your guardian. Thank you”.

The socio-economic status scale contains the following items with their weightage:
1. Education- Within this variable there are eight categories of items which relate to the parental education of the guardian. Scores allotted to each category are given below:-

a) Doctorate Degree – 8  
b) Post-Graduate Degree – 7  
c) Graduate Degree – 6  
d) Higher Secondary – 5  
e) High School-4  
f) Middle school – 2  
g) Primary school – 1  
h) Illiterate – 0

2. Occupation:- The item of occupation relates to the primary education of the parent or head of the family. There are seven categories of items within this variable. Scores allotted to each category from a to g are 10,7,5,4,3,2,1 respectively. A short description of these categories are given below:-

a) The highest category consists of high professions as educational, medical, legal, high administrative jobs, big factory owners, big farm owners etc.

b) This category consists of semi-professional group involving college or post-high school education such as non-gazette officers, high school teachers etc.

c) Clerical jobs, elementary school teachers, shop owners etc.

d) Skilled workers such as mechanic, engine driver, car driver etc.
e) Semi-skilled workers such as factory workers, laboratory attendants etc.

f) Such occupations which require neither education nor training such as domestic servants, watchmen etc.

g) Unemployed - Dependent on others

3. **Income**- There are six income categories with the scores allotted to them as given below:

a) Above Rs. 50,000 ------------ 12

b) Between Rs. 25,000 and Rs. 50,000 ----------9

c) Between Rs. 10,000 and Rs. 25,000…………..5

d) Between Rs. 5000 and Rs. 10,000 ----------- 3

e) Between Rs. 3000 and Rs. 5000 ………….2

f) Below Rs. 3000 …………………1

4. **Cultural Living**- Within this variable there are three items i.e. item no. 4, 5, 6 on the scale which concern with expenses on newspapers, magazines and expenses in the form of pocket money.

Item No. 4 concerns informations regarding purchase of house hold articles in the house. There are three categories of sub-items in this category. Scores allotted for the categories a, b, c, are 2, 1, 0 respectively.

Item No. 5. Concerns the purchase of Newspaper and magazines. There are four categories of sub-items. Scores allotted for the categories a, b, c, d are 3, 2, 1, 0 respectively.
Item No. 6 concerns information regarding availability of money for pocket expenses. Score of 2 is allotted for ‘Yes’ (category ‘a’) answer and zero for ‘no’ (category ‘b’) answer.

5. Social Participation: - This variable consists of two variables i.e. Item No. 7 and 8

Item No. 7 concerns club membership of the parents. Scores allotted for ‘yes’ (category ‘a’) and ‘no’ (category ‘b’) are 2 and zero respectively.

Item No. 8 concerns quantum and nature of social participation. Four levels of social participation has been provided within this item i.e. membership of one organization, membership of more than one organization, holding office in one organization and holding office in more than one organization. Score of 1, 3, 4 and 5 are allotted respectively for participation and zero is allotted for non-participation.

Thus the scores for socio-economic status ranged from 2 to 44. Low scores indicated a low level of socio-economic status and high scores indicated a high level of socio-economic status.

3.11 PILOT STUDY

The pilot study was conducted with the objective of trying out to design the instrument and to establish its reliability. A sample of 30 students at the secondary level. Three schools has chosen (Government, Government Aided and Private Schools) for the pilot study. Since the research instrument were self-explanatory and simple, when administered, the students did not face any difficulty in completing the instruments.
3.11.1 Validity

The research instrument selected and constructed were subjected to validity check using Bentler-Bonette (1980) Coefficient of Validity method. The BBNn Normd Fit Index for the selected research instruments are as follows:

<table>
<thead>
<tr>
<th>Tools</th>
<th>BBNn-Normd Fit Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Progressive Matrices scale developed by Raven, 1960</td>
<td>0.97</td>
</tr>
<tr>
<td>Achievement Motivation Scale Constructed by G.Sundara murthy and Dr. D. Vinodh Kumar</td>
<td>0.94</td>
</tr>
<tr>
<td>Classroom Climate scale developed by Babu, 1994</td>
<td>0.92</td>
</tr>
<tr>
<td>Socio-economic Status Scale developed by Shrivastava, 1991</td>
<td>0.90</td>
</tr>
</tbody>
</table>

3.11.2 Reliability

Reliability of the instruments was established using the Cronbach’s Alpha method (Cronbach, 1951), as it is a more robust test of reliability compared to the simple test-retest method or parallel form reliability.

- The reliability of Standard Progressive Matrices scale developed by Raven, 1960 is found to be 0.76.
- The reliability of Achievement Motivation Scale is found to be 0.84
- The reliability of Classroom Climate scale developed by Babu, 1994 is found to be 0.84
• The reliability of Socio-economic Status Scale developed by Shrivastava, 1991 is found to be 0.80.

3.12 MAIN STUDY

The investigator proceeded with the main study after establishing the workability of the research instrument using tests of validity and reliability. The main study was conducted with the matching group of students who were not used for the pilot study.

The procedure consisted of a systematic selection of students exercising all controls. The subjects thus selected were administered all the research instruments as group tests. The data thus collected was subjected to suitable statistical analyses in verification of the hypotheses.

3.13 CONCLUSION

The results of the analyses are classified and presented in the following chapters with appropriate interpretations and specific discussions with probable attributes as explanation of the results.