CHAPTER III
THE PRESENT STUDY
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CHAPTER III
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3.1 INTRODUCTION

According to Brink (1999), the aim of data analysis is to reduce and synthesis information to make sense out of it and to allow inference about a population, while the aim of interpretation is to combine the results of data analysis with value statements, criteria and standards in order to produce conclusions, judgments and recommendations.

3.2 STATEMENT OF THE PROBLEM

The problem under investigation is to trace the factors that facilitate achievement in Mathematics of students of standard X in Tamilnadu district and the title of the study is represented as “Scholastic Achievement in Mathematics Education”

Academic achievement assumes primary importance in the context of an education system aimed at progressive scholastic development of the child and human resources development at the macro level. Various factors affect the scholastic achievement of the students by distracting them and here in this study the investigator concentrated on the personal factors attitude towards Mathematics, anxiety and the environmental factors that concentrate on the home and class room of the students, those have played an important role on the achievement of students in Mathematics.

3.3 SIGNIFICANCE OF THE STUDY

The present study is on the scholastic achievement in Mathematics education of standard X students. Achievement in Mathematics is influenced by variables like attitude,
anxiety, etc. Scholastic achievement in Mathematics in X standard level is important since it is the first step for entering into the higher education.

Amongst the subjects taught in schools, Mathematics is considered as one of the toughest subject with poor performance of students. The lower level of pass percentage has been a matter of serious concern. Thus, Mathematics has been a problem area for majority of secondary schools in India.

Mathematical skill is essential not only for the high school education aspiring section but also in several competitive examination for jobs depends upon the basic understanding in Mathematics. Thus, perfect education in secondary schools in Mathematics subject in particular has been a serious issue needing investigation. Hence, the present investigation is undertaken to analyse the educational scenario of some selected secondary schools located in Tamilnadu.

3.4 OBJECTIVES OF THE STUDY

The following were the objectives of the study:

1. To study the attitude, classroom environment, home environment, anxiety and scholastic achievement in mathematics of X standard students.

2. To study whether students differ in their attitude, classroom environment, home environment, anxiety and scholastic achievement in mathematics with respect to gender, medium of instruction, type of management, community and family monthly income.

3. To study whether gender, medium of instruction, type of management, community and family monthly income of students are associated with the following
   i. Level of attitude
   ii. Level of Classroom environment
   iii. Level of Home environment
   iv. Level of anxiety
   v. Level of Achievement in Mathematics
4. To study whether Level of achievement in Mathematics is associated with
   i. Level of attitude
   ii. Level of anxiety
   iii. Level of classroom environment
   iv. Level of home environment
5. To study the correlation and regression of scholastic achievement in Mathematics on the
   variables attitude, anxiety, classroom environment and home environment.

3.5 HYPOTHESIS OF THE STUDY

The hypotheses formulated for the present study are stated as follows:

1. Male and female students differ with respect to the variables of scholastic achievement
   such as attitude, classroom environment, home environment and anxiety.
2. Students belonging to English and Tamil medium differ with respect to the variables of
   scholastic achievement.
3. Students studying in different management type of schools differ with respect to the
   variables of scholastic achievement.
4. Students belonging to different communities differ with respect to the variables of
   scholastic achievement.
5. Students with different family monthly income differ with respect to the variables of
   scholastic achievement.
6. Gender of students is associated with level of their attitude.
7. Gender of students is associated with level of their anxiety.
8. Gender of students is associated with level of their classroom environment.
9. Gender of students is associated with level of their home environment.
10. Gender of students is associated with level of achievement in Mathematics.
11. Medium of students is associated with level of their attitude.
12. Medium of students is associated with level of their anxiety.
13. Medium of students is associated with level of their classroom environment.
14. Medium of students is associated with level of their home environment.
15. Medium of students is associated with level of achievement in Mathematics.
16. Type of management of school is associated with level of attitude of students.
17. Type of management of school is associated with level of classroom environment of students.
18. Type of management of school is associated with level of home environment of students.
19. Type of management of school is associated with level of anxiety of students.
20. Type of management of school is associated with level of achievement in mathematics of students.
21. There is association between community and level of attitude of students.
22. There is association between community and level of anxiety of students.
23. There is association between community and level of classroom environment of students.
24. There is association between community and level of home environment of students.
25. There is association between community and level of achievement in Mathematics of students.
26. There is association between family monthly income and level of attitude of students.
27. There is association between family monthly income and level of anxiety of students.
28. There is association between family monthly income and level of classroom environment of students.
29. There is association between family monthly income and level of home environment of students.
30. There is association between family monthly income and level of achievement in Mathematics of students.
31. There is association between level of attitude of students and level of achievement in mathematics.
32. There is association between level of anxiety and level of achievement in Mathematics of students.
33. There is association between level of classroom environment and level of achievement in Mathematics of students.
34. There is association between level of home environment and level of achievement in Mathematics of students.
35. There is correlation between scholastic achievement in Mathematics and attitude, anxiety, class room environment and home environment.

3.6 METHOD OF STUDY

The present study is a Normative method of research, since the study is on the effect of the variables attitude towards Mathematics, anxiety, class room environment and home environment on achievement in Mathematics. The descriptive research concentrates on describing, recording, analyzing and interpreting conditions that exist. It involves some type of comparison or contrast and attempts to discover relationship between existing non-manipulated variables. Therefore the Normative research method has been used in the present study.

3.7 VARIABLES UNDER STUDY

The present investigation is an attempt to study the extent of relationship between “achievement in Mathematics” as dependant variable and the efficiency of some selected independent variables in predicting the scholastic achievement in Mathematics. The dependant and independent variables selected for the present study are:

Dependant variable

Academic Achievement in Mathematics

Independent Variable

Attitude towards Mathematics
Anxiety
Class room environment for Mathematics
Home environment for Mathematics
Factors of Achievement test in mathematics
**Personal Variables**
Gender
Medium of Instruction
Community
Family monthly income

**School related variables**
Type of management

### 3.8. TOOLS USED

The following are the tools used for measuring the research variables of the study:

1. Aiken’s Revised Math Attitude Scale (1974) has been adopted and revalidated by the Investigator.
2. Maths Anxiety Scale constructed by Sadia Mahmood (2011) (has been adopted and revalidated by the Investigator.
3. Class Room Environment Inventory for Mathematics constructed by Santhamma Raju and Ancel Maria (1998) has been adopted and revalidated by the Investigator.
4. Home Environment Inventory for Mathematics constructed by Santhamma Raju and Ancel Maria (1998) has been adopted and revalidated by the Investigator.
5. Achievement Test in Mathematics has been developed and validated by the Investigator to measure scholastic achievement in Mathematics.
3.8.1 Description of Tools

Details of the tools used for data collection are presented in the Table 3.1

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Name of the Tool</th>
<th>Variable measured</th>
<th>No. of items</th>
<th>Time limit</th>
<th>Scoring for the responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Attitude to Mathematics Scale</td>
<td>Attitude towards Mathematics</td>
<td>20</td>
<td>15 Min</td>
<td>For positive statements&lt;br&gt;Strongly Disagree = 0&lt;br&gt;Disagree = 1&lt;br&gt;Undecided = 2&lt;br&gt;Agree = 3&lt;br&gt;Strongly agree = 4</td>
</tr>
<tr>
<td>2.</td>
<td>Maths Anxiety Scale</td>
<td>Anxiety</td>
<td>14</td>
<td>15 Min</td>
<td>For positive statements&lt;br&gt;Strongly Disagree = 1&lt;br&gt;Disagree = 2&lt;br&gt;Undecided = 3&lt;br&gt;Agree = 4&lt;br&gt;Strongly agree = 5</td>
</tr>
<tr>
<td>3.</td>
<td>Classroom Environment Inventory for Mathematics</td>
<td>Classroom Environment for Mathematics</td>
<td>42</td>
<td>30 Min</td>
<td>For positive statements&lt;br&gt;Agree = 3&lt;br&gt;Undecided = 2&lt;br&gt;Disagree = 1</td>
</tr>
<tr>
<td>4.</td>
<td>Home Environment Inventory for Mathematics</td>
<td>Home Environment for Mathematics</td>
<td>22</td>
<td>30 Min</td>
<td>For positive statements&lt;br&gt;Agree = 3&lt;br&gt;Undecided = 2&lt;br&gt;Disagree = 1</td>
</tr>
<tr>
<td>5.</td>
<td>Achievement Test in Mathematics for Standard X</td>
<td>Achievement in Mathematics</td>
<td>76</td>
<td>90 Min</td>
<td>Correct option = 1&lt;br&gt;Other option = 0</td>
</tr>
</tbody>
</table>

3.9 SAMPLE OF THE STUDY

An adequate and representative sample is essential for the study to be scientific, effective and reliable and also to minimize the sampling errors. This study was conducted on a representative sample of 1007 students of standard X, were selected randomly from
different high schools in two districts namely, Chennai and Thiruvallur. While selecting the schools due representation was given to type of management and board of affiliation. The distribution of sample based on personal and school related variables are given in Table 3.2.

Table 3.2 Distribution of Sample

<table>
<thead>
<tr>
<th>Distribution</th>
<th>No. of Schools</th>
<th>No. of Students</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>District</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chennai</td>
<td>8</td>
<td>747</td>
<td></td>
</tr>
<tr>
<td>Thiruvallur</td>
<td>3</td>
<td>260</td>
<td>1007</td>
</tr>
<tr>
<td><strong>Management</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corporation</td>
<td>2</td>
<td>167</td>
<td></td>
</tr>
<tr>
<td>Government Aided</td>
<td>2</td>
<td>189</td>
<td></td>
</tr>
<tr>
<td>Matriculation</td>
<td>3</td>
<td>312</td>
<td></td>
</tr>
<tr>
<td>Government</td>
<td>4</td>
<td>339</td>
<td>1007</td>
</tr>
<tr>
<td><strong>School Type</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boys</td>
<td>2</td>
<td>155</td>
<td></td>
</tr>
<tr>
<td>Girls</td>
<td>4</td>
<td>410</td>
<td></td>
</tr>
<tr>
<td>Co-education</td>
<td>5</td>
<td>442</td>
<td>1007</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td></td>
<td>443</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td></td>
<td>564</td>
<td>1007</td>
</tr>
<tr>
<td><strong>Medium</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>English</td>
<td></td>
<td>636</td>
<td></td>
</tr>
<tr>
<td>Tamil</td>
<td></td>
<td>371</td>
<td>1007</td>
</tr>
</tbody>
</table>

3.10 COLLECTION OF DATA

The Investigator personally visited various schools in Chennai and Thiruvallur district and met the Heads of the schools and sought their permission and cooperation in administering the achievement test and the test on the tools, for their school students. Finally, the test was conducted for nine school students with the help of Mathematics teachers, on different dates. The information about the test was communicated to the students earlier itself so as to prepare themselves for the test. A personal data sheet was attached with the questionnaire to get relevant personal datas of the students. Clear instructions were given to the students to respond to the questionnaire in time. The test
procedure was strictly followed and answer sheets were collected on time. The data so collected were taken up for statistical analysis.

3.11 STATISTICAL TECHNIQUES USED

The following statistical techniques were used for the analysis of data.

i. Item Analysis – Pilot Study
ii. Descriptive Analysis (Mean and S.D.)
iii. Inferential Analysis (t-test, F-test and Chi-Square test)
iv. Multiple Correlation and Regression Analysis

3.11.1 Structural Equation Model Analysis

The structural equation modeling technique was used to develop a model to fit the data collected for the research variables and P-values for each research variable were obtained to maximize the scholastic achievement in Mathematics.

3.12 LIMITATIONS OF THE STUDY

The Investigator confined the study to a representative sample of students of standard X from selected schools in Chennai and Thiruvallur districts. The tools of accepted validity and reliability were used to collect the data. The selection of independent variables was restricted to a limited number considering the difficulty of measuring the variables and availability of the standardized tools. The selection of dependant variable was also confined. For the present study, Achievement in Mathematics only has been selected.
3.13 ORGANISATION OF THE REPORT

The report has been presented in six chapters.

Chapter I comprises of a brief introduction, importance of Mathematics, some discussion about education system in India, significance of Mathematics education in India and Tamilnadu, scholastic achievement of Mathematics education in India and Tamilnadu, need for the study and variables under study.

Chapter II presents the review of studies related to the present investigation have been summarized and presented.

Chapter III gives the statement of the problem, significance of the study, objectives of the study, hypotheses of the study, method of study, variables under study, tools used for data collection, sample of the study, statistical techniques used for analysis and limitations of the study.

Chapter IV gives the details of procedure and construction of Achievement Test in Mathematics and description and revalidation of the tools selected.

Chapter V deals with the details of analysis and interpretation of data are provided.

Chapter VI includes the summary of study, major findings, educational implications and suggestions for further research in the area.

Followed by chapter VI, Bibliography and Appendices are given.