# CHAPTER - III

## METHODOLOGY

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CHAPTER - III

METHODOLOGY

3.1 INTRODUCTION

Methodology is a compiled work and the lay out description of the steps adopted by the investigator at the various phases in the study. This chapter deals with the detailed methodology employed for studying the present problem. The tool developed and validated data collection procedures followed is outlined in this chapter. The delimitation of the study is also explained. Design of the study, sample, methodology, tools used, validity and reliability of the tools are also explained in this chapter.

3.2 RATIONALE OF THE STUDY

Mathematics is a curious subject in which students often get adverse reaction to solve mathematical problems. While solving mathematical problems, the students struggle a lot to understand the problem and they are at times unable to solve problems in the classroom climate. In order to control the Maths Anxiety among students some remedial activities are provided to them which will surely help them to obtain particular task in mathematics such as Computation Ability, numerical ability, formational abilities and so on. In rationale there are so many intervening variables involved on Maths Anxiety of students studying at secondary level. In this concept the role of teacher is very essential to concentrate on the level of Maths Anxiety students which deals with the proper activation of mind of the students to deal effectively with the mathematical problems. This helps them to perform higher achievement in the subject of mathematics. The present investigation is very much
helpful for the teachers to control their children without Maths Anxiety and they will perform better in mathematics studying at secondary level.

3.3 TITLE OF THE STUDY

INFLUENCE OF SELF-CONCEPT, LOCUS OF CONTROL AND MATHS ANXIETY ON THE COMPUTATION ABILITY OF MATHEMATICS STUDENTS AT SECONDARY LEVEL

3.4 STATEMENT OF THE PROBLEM

The present investigation has aimed at finding out the intervening variables that can be influenced Self - Concept, Locus of Control and Maths Anxiety of the students who are studying at secondary level and also to find out the Computation Ability which helps them to perform better in the mathematics. In this regard, the present investigation deals with the select intervening variables which influence or control the Self - Concept, Locus of Control and Maths Anxiety of the secondary level students. Because secondary level students are having under pressure regarding the school activities and social activities related to their performance in the academics. In this area the investigator has attempted a study to find out the intervening variables which is incorporated to controlling the Self - Concept, Locus of Control and Maths Anxiety and enhancing the Computation Ability exclusively for the mathematics at secondary level students.
3.5 OBJECTIVES OF THE STUDY

The following are the objectives for the present investigation

1. To assess the level of Self-Concept, Locus of Control, Maths Anxiety and Computation Ability of students at secondary level.

2. To find out the significant differences if any between the Self-Concept, Locus of Control and Maths Anxiety of students at secondary level with respect of gender, locality, Nature of school, type of school, parents occupation and parent income.

3. To find out the relationship between Self-Concept and Computation Ability, Locus of Control and Computation Ability, Maths Anxiety and Computation Ability of students at secondary level.

3.6 HYPOTHESES OF THE STUDY

The following hypotheses are formulated for the present study

3.6.1. Major Hypothesis

1. The level of Self – Concept, Locus of Control, Maths Anxiety, and Computation Ability is moderate in students who are studying at secondary level.

2. There is no significant difference between the Self – Concept, Locus of Control, Maths Anxiety and Computation ability in students at secondary level.

3. There is no relationship between the Self - Concept, Locus of Control, Maths Anxiety and Computation Ability in students at secondary level.
3.6.2 Specific Hypotheses

4. There is no significant difference between the Self-Concept among students who are studying at secondary level with respect to gender.

5. There is no significant difference between the Self-Concept among students who are studying at secondary level with respect to locality of school.

6. There is no significant difference between the Self-Concept among students who are studying at secondary level with respect to nature of school.

7. There is no significant difference between the Self-Concept among students who are studying at secondary level with respect to type of school.

8. There is no significant difference between the Self-Concept among students who are studying at secondary level with respect to parents occupation.

9. There is no significant difference between the Self-Concept among students who are studying at secondary level with respect to parents income.

10. There is no significant difference between the Locus of Control among students who are studying at secondary level with respect to gender.

11. There is no significant difference between the Locus of Control among students who are studying at secondary level with respect to locality of school.

12. There is no significant difference between the Locus of Control among students who are studying at secondary level with respect to nature of school.
13. There is no significant difference between the Locus of Control among students who are studying at secondary level with respect to type of school.

14. There is no significant difference between the Locus of Control among students who are studying at secondary level with respect to parents occupation.

15. There is no significant difference between the Locus of Control among students who are studying at secondary level with respect to parents income.

16. There is no significant difference between the Maths Anxiety among students who are studying at secondary level with respect to gender.

17. There is no significant difference between the Maths Anxiety among students who are studying at secondary level with respect to locality of school.

18. There is no significant difference between the Maths Anxiety among students who are studying at secondary level with respect to nature of school.

19. There is no significant difference between the Maths Anxiety among students who are studying at secondary level with respect to type of school.

20. There is no significant difference between the Maths Anxiety among students who are studying at secondary level with respect to parents occupation.

21. There is no significant difference between the Maths Anxiety among students who are studying at secondary level with respect to parents income.
3.7 RESEARCH DESIGN

In the first phase, identifying the Self - Concept, Locus of Control, Maths Anxiety among the mathematics students who are studying at secondary level, by using descriptive survey research was carried out. In the second phase, identifying the variables contributed or disturbs the Computation Ability among secondary level of students were undertaken. In third phase, of assessing the level of Computation Ability of Mathematics students at secondary level was done.

3.8 OPERATIONAL DEFINITION OF KEY TERMS

Self - Concept

It is the concept of secondary school maths students that gives a thorough description about the mathematical concept and personal judgement related to maths.

Locus of Control

This is the external and internal factors responsible for successful and unsuccessful performance of students in Mathematics particularly Computation Ability.

Maths Anxiety

The qualities such as apprehension of read distress, uneasiness and tension expressed by secondary school maths students when they have unpleasant emotional state while solving mathematical problems and test.
Computation Ability

It is a kind of mental power (or) skill needed to solve Mathematical problems and difficult areas by better computation among maths students studying at secondary level.

Secondary level

The students who are studying 9th standard under state board syllabus in the school of Trichy and Pudukottai districts.

3.9 VARIABLES IN THE STUDY

Variables involved in the study are as follows.

Independent Variables

Self - Concept, Locus of Control and Maths Anxiety

Dependent Variable

Computation Ability

Demographic Variables

In addition, the following variables are taken as demographic variables of secondary school students for the present investigation.

* Gender
* Locality of School
* Type of School,
* Nature of School
* Parents Occupation and
* Parents Annual Income
3.10. POPULATION OF THE STUDY

Population refers to sample for the purpose of research, which are accessible for the present investigator. Here population means IX standard students who are studying in the high schools of Trichy and Pudukottai districts, Tamilnadu.

3.11 SAMPLE AND SAMPLING TECHNIQUE

In the present study simple random technique has been used to collect the sample from the target population. The sample size comprises of 500 IX standard level students who are studying in high schools of Trichy and Pudukottai districts in Tamilnadu State.

Table 3.1
Sample Frame for the Study

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Name of School</th>
<th>No. of Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Govt Hr.Sec.School, Thalakkudi, Trichy</td>
<td>30</td>
</tr>
<tr>
<td>2.</td>
<td>KAP Viswanathan Hr.Sec. School, Thillai Nagar, Trichy</td>
<td>25</td>
</tr>
<tr>
<td>3.</td>
<td>Govt Hr.Sec. School Poovalur, Trichy</td>
<td>25</td>
</tr>
<tr>
<td>4.</td>
<td>Govt Hr.Sec. School Sirugambur, Trichy</td>
<td>40</td>
</tr>
<tr>
<td>5.</td>
<td>Govt Girls Hr.Sec. School Mannachanallur, Trichy</td>
<td>40</td>
</tr>
<tr>
<td>6.</td>
<td>LNP Girls Hr.Sec. School Lalgudi, Trichy</td>
<td>40</td>
</tr>
<tr>
<td>7.</td>
<td>Govt. Hr.Sec. School Peruvalppor, Trichy</td>
<td>40</td>
</tr>
<tr>
<td>8.</td>
<td>Govt High school Siruganur, Trichy</td>
<td>30</td>
</tr>
<tr>
<td>9.</td>
<td>Govt.Hr.Sec. School, Pullivalam, Trichy</td>
<td>50</td>
</tr>
<tr>
<td>10.</td>
<td>Govt Hr.Sec. School Valadi, Trichy</td>
<td>30</td>
</tr>
<tr>
<td>11.</td>
<td>Govt Girls Hr.Sec. School, Keeranur, Pudukottai</td>
<td>30</td>
</tr>
<tr>
<td>12.</td>
<td>Govt Boys hr.Sec. School Keeranur, Pudukottai</td>
<td>20</td>
</tr>
<tr>
<td>13.</td>
<td>Govt Model Hr.Sec. School, Machuvadi, Pudukottai</td>
<td>30</td>
</tr>
<tr>
<td>14.</td>
<td>Govt Hr.Sec. School (Special) Mathur, Pudukottai</td>
<td>40</td>
</tr>
<tr>
<td>15.</td>
<td>Govt High School, Kulathur, Pudukottai</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>500</td>
</tr>
</tbody>
</table>
3.12 RESEARCH TOOLS USED FOR THE STUDY

The following are the tools used in the present investigation;

1. Self - Concept Scale (James Ayodele 2011)
2. Locus of Control Scale (Nowicki-Strickland 1973)
3. Math anxiety Scale (Diana K. May 2004)
4. Computation Ability Test

Based on the above tools the investigator has added some items relevant to the present list in consultation with eminent academics in Mathematics and Education. He also found reliability and validity of the constructed tool. Additionally, the investigator got suggestion from the subject experts such as Dr.CR. Vasantha former Principal, AUCE, Karaikudi, and also had consultation with the Research Supervisor Dr.AR. Saravanakumar Assistant Professor, DDE, Alagappa University and validated the tools by applying the statistical techniques related to validation.

3.1.2.1 Procedure in tool construction

The investigator has gone through various related tools and identified the formation of research tool, which is used to construct the research tool for the present investigation such as Self - Concept, Locus of Control and Maths Anxiety. In order to construct the research tool the investigator identified some kind of standardized tools and added or deleted some items relevant or irrelevant to the tool based upon the prior consultation with the subject experts and found reliability and validity of the prepared research tool.
3.13 PILOT STUDY

The Pilot study was conducted with the initial tools in the five high schools in and around Kumulur, Trichi district. Reliability for the entire tools was established by appropriate statistical techniques. For validity, opinion of experts and their recommendation were received for the selection and construction of items regarding the research tools to establish face validity and content validity.

3.14 CONSTRUCTION OF TOOLS

Various tools related to the factors of the present study have been surveyed by the investigator in the review of literature. A careful study of these tools is done and after a thorough discussion with the experts and earlier research studies in the reviewed literature in the field of educational psychology, the investigator decided to construct the following tools through pilot stage, item analysis, reliability and validity.

The following are the tools used in the present investigation;

1. Self - Concept Scale
2. Locus of Control Scale
3. Maths Anxiety Scale
4. Computation Ability Test

The investigator conducted the achievement test regarding the computation abilities. The ninth standard mathematics subject is taken to determine and assess the computation abilities among the secondary level students.
3.15 RELIABILITY

The reliability of the Student’s Self - Concept Scale for secondary school students was done by using Spilt- Half Method is found to be 0.81. Hence it is considered a more reliable one to the present investigation.

The reliability of the Student’s Locus of control Scale for secondary school students was done by using Spilt- Half Method is found to be 0.82. Hence it is considered a more reliable one to the present investigation.

The reliability of the Student’s Maths Anxiety Scale for secondary school students was done by using Kuder Richardson Method is 0.79. Hence it is considered a more reliable one to the present investigation.

The reliability of the Computation Ability Assessment Scale for secondary school students was done by using Test-re-test method is 0.80. Hence it is considered a more reliable one to the present investigation.

3.16 VALIDATION OF TOOLS

Validity of the research tool or procedure that measures what it purports to measure. John W. Best (1989) quoted that validity is the quality of a data gathering instrument or procedure that enables it to measure what it is supposed to measure. The index of reliability is sometimes taken as a measure of validity (Garret, 1981). For ascertaining the validity, the investigator used content validity, face validity and intrinsic validity.
**Content Validity**

Content validity explains whether the items in a test are constructed around appropriate content. Best (1981 & 1977) measures that there is no numerical way to express the content validity, but it can be assessed by a panel of experts in the field who could judge its adequacy.

The investigator got the content validity by referring to field experts in Maths and Education. Therefore it can be said that Self-Concept, Locus of Control and Maths Anxiety and Computation Ability by the investigator possess content validity.

**Face Validity**

This is the term used to characterize test materials that measures what the author desires to measure. That is, the test contains items that seem to be related to the variable being measured. The investigator received recommendation from the experts on the statements for assessing the maths anxiety and computation ability so that they got face validity.

**Intrinsic Validity**

The square root of the reliability values of the checklist means its intrinsic validity. The obtained intrinsic validity of the Student’s Self-Concept, Locus of Control and Maths Anxiety for secondary school students is 0.893 high and validated.

The obtained intrinsic validity of the Student’s Computation Ability Scale for secondary school students is 0.88 high and validated.
3.17 SCORING PROCEDURE OF THE DEVELOPED TOOLS

The scoring procedure for the tools used in the present investigation is:

The Student’s Locus of Control, Self - Concept ( ) Maths Anxiety ( ) Scale and achievement test (computation ability ) for secondary school students.

The subjects required to respond to each item in term of assessing the Self - Concept, Locus of Control and Maths Anxiety of secondary students, which is classified in to four scale such as Agree (A), Strongly Agree (SA), Disagree (DA), Strongly Disagree (SDA) with a weightage score of 4,3,2, and 1 respectively are given. In Scoring of the Computation Ability test each question carries one mark. The total achievement test computation was constituted for 50 marks.

3.18 PROCEDURE OF DATA COLLECTION

The investigator personally visited the respective schools and met the school authorities for permission to collect the data from the ninth class students. After getting the permission from the school authorities, the investigator met the students and explained about the study for developing rapport with the help of teachers. The investigator assured that this data was only for research purpose. The investigator distributed the questionnaire such as Self - Concept, Locus of Control and Maths Anxiety for secondary school students are administered to the sample of 500 secondary school students in the selected Government and Government Aided Schools in Trichy and Pudukottai districts in Tamil Nadu.
Rationale of Computation Ability Test

The investigator has identified 100 of students out of 500 samples size who had high level of Maths Anxiety, that group of students to take the investigation to identify the level of Computation Ability to the present investigation with applying computation ability test prepared by the investigator. After completion of data collection, the scoring was done as per the scoring procedure given above.

3.19. DATA COLLECTION

The investigator selected 15 schools to collect the data regarding the study. Before that, the investigator had fully explained all the research problems and tools, statements included in the questionnaire to the secondary level students. As and when they asked any doubts regarding the questionnaire as well as investigation, the investigator immediately answered them. After this process the data were collected from the students concerned.

3.20. STATISTICAL TECHNIQUES

The following statistical technique were applied to the present investigation

- Differential analysis
- Mean ,SD
- ‘t’ Test
- Karl Pearson’s product moment correlation
- ANOVA
3.21 DELIMITATION OF THE STUDY

1. The present study was confined to the Self - Concept, Locus of Control and Maths Anxiety of Computation Ability in secondary level students only.

2. The present investigation selected only 500 IX standard students studying in the schools of Trichy and Pudukottai Districts only.

3. The present investigation has selected to the students who are studying government and government aided schools only.

3.22 CONCLUSION

The Result and Discussions is followed in the present study is discussed in the next chapter-IV.