Chapter - III

THE PRESENT STUDY
CHAPTER- III

THE PRESENT STUDY

This chapter deals with the statement of the problem, title of the problem, Need for the present study, Purpose of the study, Scope of the study, Definitions of various terms, Objectives of the study, Hypotheses formulated, Variables included and Limitations of the present study.

3.1 INTRODUCTION

Education plays a very important role in the life of human beings. The development of a country is primarily determined by the quality of its human resources. India today needs effective and productive citizens with scientific and constructive thinking and positive attitudes. This need can be met by well-planned educational curricula, including a systematic mathematics programme at the school level.

At present in our country, there are five levels of education. Pre-Primary, Primary, Secondary, Intermediate and Higher education levels. Primary and secondary levels are considered very important, as they lay proper foundation in the life of the students.

Mathematics is one of the subjects of study both at primary and secondary levels of education. Different education commissions set up by the government of India have stressed the need for strengthening the teaching of mathematics at school level. National policy of education 1986, made a mention about mathematics education as “Mathematics should be visualized as the vehicle to train a child to think, reason, analyse and articulate logically. Apart from being a specific subject, it should be treated as a concomitant to any subject, involving analysis and reasoning”.

The achievement in mathematics of X class students is the primary concern of the investigator, in the present study. Mathematics has been considered a difficult subject by majority of students at secondary level. Is it
due to lack of proper teaching of the subject? or due to lack of proper attitude towards the subject- lack of proper encouragement – lack of proper study habits- one should ponder. But research in psychology has shown that “almost every subject can be taught in some intellectually honest form to any child at any stage of development, if it is properly taught”. No system of education, no methodology and no text book, can rise above the level of it’s teachers. If a country wants to have quality of education, it must have quality teachers. Hence the mathematics teacher plays a pivotal role in making the students to develop positive attitude towards the subject and to remove the fear of the subject.

At present, the state of teaching mathematics, in the majority of our schools is far from satisfactory. The rate of failures is considerably high when compared with other subjects. The mathematics teachers have to think over this problem of failures in mathematics or under achievement in mathematics and try to change the situation, by suitably finding ways and means of improving the achievement in mathematics. The investigator wants to find out the effect of various psycho-sociological and demographical variables on the achievement in mathematics at secondary level. It is against this backdrop that a comprehensive and constructive research work is felt necessary, relating to the achievements in mathematics, to suggest various ways and means of improving the achievement in mathematics of X class students.

After reviewing the related literature in the area of academic achievement particularly the scholastic achievement in mathematics, the investigator observed that there were no studies on the effect of variables like ‘number of study honors’, ‘time spent daily for mathematics working’, ‘help from family members for mathematics’ and ‘separate study room’ etc. on the scholastic achievement. Hence the investigator has shown some interest to know the effect of these variables on the achievement of 10th class students in mathematics.
3.2 STATEMENT OF THE PROBLEM

The present study is concerned with the finding out the effect of various psycho-sociological and demographic variables on the achievement in mathematics of X class students of Chittoor district, belonging to the different regions; (i.e) the four revenue divisions of Chittoor district. It examines the achievement in mathematics of X class students of the schools belonging to the above regions. It establishes the relationship between the various psycho-sociological and demo-graphical variables and other variables namely study habits, personality factors, self-concepts and socio-economic conditions of the students and achievement in mathematics of X class students of Chittoor district. It also predicts scholastic achievement with the help of different sets of psycho-sociological variables / independent variables.

3.3 TITLE OF THE PROBLEM

The title of the present study is stated as “Achievement of X class Students in Mathematics In Relation To Certain Psycho-Sociological Variables”

3.4 NEED FOR THE PRESENT STUDY

In olden days, the system of education was totally different from that of the present day system. The teacher and the taught lived together and they had devoted their entire time for studies exclusively. Now things have changed, as civilization improved and with the explosion of knowledge, the life style of people is changed beyond imagination.

The societies have come under the impact of science and technology and as a result of which, there are many means and sources of learning. Various psychological theories came into existence, which have their impact on methods of teaching. Both the teachers and students have to adopt new methods of teaching and efficient procedures of learning.
Everybody needs some knowledge of mathematics in one way or other. It is felt that for an ordinary man, the knowledge acquired during primary and upper primary level is sufficient. Consequently, there is a great controversy over making it an optional or compulsory subject of study at the secondary level. It is believed that mathematics is exceptionally a difficult subject. Its study requires some special ability and intelligence and hence everybody should not be burdened with the study of this subject. But the other view is that mathematics does not require special ability for its successful performance but it needs general intelligence. A dedicated and honest teacher of mathematics can make the learning very interesting and exciting, thus changing the attitude and outlook of mathematics. However it has been widely accepted for its inclusion in the school curriculum as a compulsory subject upto 10th class level on the recommendations of various Education Commissions appointed by government of India. It is clear that at the secondary level mathematics functions as a strong foundation for those who want to pursue mathematics at higher level. At the same time it functions as a tool to provide necessary mathematical skills for those who want to opt for arts, commerce, or Humanities at higher level. Hence the role of mathematics at the secondary level is very significant as it safeguards the interests of both types of students. Accordingly mathematics teachers at secondary level have to realize the role of mathematics and teach the fundamental concepts in the subject, thus creating interest for the subject among the pupils.

Syllabus in various subjects has been constantly under revision and so also in mathematics. Various factors will have their effect on the achievement in various subjects and so in mathematics. Having accepted the influence of various factors on achievement in mathematics, the investigator desires to establish a relationship between achievement in mathematics and various psycho-sociological factors and demographic variables. Scholastic achievement continues to be one of the most important variables held in high
esteem in all cultures, countries and times. Hence the research related to the area of academic achievement is an ever growing concern of the researchers, educationists and administrators.

Academic achievement is of paramount importance, particularly in the present socio-economic and cultural contexts. There is a need to identify the psycho-sociological factors, which influence the scholastic achievement in mathematics of 10th class students, in order to draw conclusions and suggest remedial measures, if any. It is rather interesting to know which of the variables of personality, study habits, socio-economic status, socio-demographic etc contribute to the scholastic achievement in mathematics. There is a need to develop mathematical models to explain the relationship between scholastic achievements in mathematics of 10th class students and psycho-sociological variables.

Though there are considerable studies on the scholastic achievement in relation to sociological and psychological factors at primary and secondary level school subjects, very few studies are found particularly in mathematics of 10th class students. The present investigation is to find the relationship between achievement in mathematics and socio-psychological, and demographical factors and also to predict the achievements in mathematics with the help of various independent variables. Further there is no much research study showing the relationship of scholastic achievement of 10th class students in mathematics with sociological variables like caste, birth order, age, sex, and personal factors like time spent for mathematics daily, help from family members, total number of hours of study and separate room for study. Hence there is a need of research study to know the influence of the above factors on the achievement in mathematics. The main aim of present study is to predict the multiple effects of independent variables on the scholastic achievement and further to suggest suitable regression equations in the prediction of scholastic achievement of 10th class students in mathematics.
The above crucial conditions lead the investigator to make an attempt in this area of scholastic achievement of 10th class students in mathematics in relation to various psycho-sociological factors.

3.5 PURPOSE OF PRESENT STUDY

In view of the important role of mathematics in the modern world, it has been imperative for any nation or the world to promote mathematics education in their respective countries. But mathematics has been considered by majority of students as a difficult subject. Hence it is necessary for a mathematics teacher, to know the factors influencing achievement in mathematics. Learners motives, emotions, needs, attitudes, outlook and interests play a very important role in learning the subject. Certain factors like, parents' educational background, home environment, study habits, type of the managements, environment in the school, abilities, self-confidence, general habits, social environment and emotional feelings etc. may have some impact in the achievement of mathematics. Hence every mathematics teacher has to evince a keen interest in knowing the effect of these factors and act accordingly so as to make the students learn the subject effectively.

Mathematics education provides a good mathematical background with the knowledge of concepts and theories. It also provides ability to apply mathematical concepts and knowledge of theorems to new situations. Sufficient mathematical skills are needed to meet the demands of the daily life. The fundamentals in mathematics have got an immense practical value in life. The knowledge and skills in these processes can be provided in an effective and systematic manner, only by teaching mathematics in schools.

The teachers of mathematics are now required to up-date their knowledge in the subject. The mathematics teacher will have to be essentially a learner. He must also have the knowledge of the factors which influence the achievement in mathematics. Sound knowledge of the effect of these factors enable the mathematics teachers to discharge their duties effectively. The
variations in the performance of the pupil in mathematics may probably be due to some personal, socio-demographic, psychological factors, which the mathematics teachers are expected to know and hence the present study.

If mathematics teachers are aware of factors influencing the achievement in the subject, they can accordingly choose the methods of teaching, use of teaching-learning materials and there by creating interest in mathematics among the students.

In general, the public examination results of 10th class (SSC) reveal that more percentage of students fail in mathematics, as compared with other school subjects. Hence it is necessary for mathematics teachers to know which of the personal, socio-demographic, psychological etc variables influence the learning and achievement of mathematics. Hence the present investigation is taken up for the purpose of knowing the influence of various variables on the achievement of 10th class students in mathematics.

The present study aims at establishing a relationship between the achievements in mathematics of 10th class students and various psychosociological factors and demographic factors. It attempts to answer the following questions.

1. Whether there is any significant influence of demographic factors on the achievement in mathematics of 10th class students.

2. Whether there is any significant influence of study habits of 10th class students on their academic achievement in mathematics.

3. Whether there is any significant influence of self-concepts of the students on the achievement of 10th class students in mathematics.

4. Whether there is any influence of 14 P.F personality factors on the achievement in mathematics of 10th class students.

5. Whether there is any impact of socio-economic factors on the achievement in mathematics of 10th class students.
6. Whether there is any influence of personal factors like sex, religion, caste, birth order, number of members in the family, time spent for mathematics study and separate room for study, etc on the achievement in mathematics.

7. Whether it is possible to predict the achievement in mathematics with the help of various psycho-socio-logical factors.

3.6 SCOPE OF THE STUDY

The main intention of the present study is to find out the relationship between achievement in mathematics of 10th class students and psycho-sociological factors, and demographic variables. The personality factors, the study habits and self concepts are measured by using relevant tools. An achievement test is constructed with the help of senior mathematics teachers and experts in the subject and standardized by the investigator, following the procedure described by H.E. Garrett in the text book “statistics psychology and education.” The score obtained in the test is taken as achievement in mathematics (Dependent Variable).

Academic achievement depends on a number of factors. It is not possible to include each and every factor in this study. Only a few variables like, management, sex, locality, caste, educational and occupational level of parents, religion, economic status of the family, size of the family, help from family members for mathematics etc have been included in this study. Attitude of pupils towards mathematics, intelligence of pupils, teachers' commitment and so many other variables having impact on achievement are beyond the scope of this study.

The study attempts to identify the type of relationship between dependent variable and independent variables (psycho-sociological variables).

The study also attempts to predict the achievement in mathematics with the help of different sets of independent variables.
The study also attempts to suggest suitable regression equations in the prediction of scholastic achievement of 10th class students in mathematics.

3.7 OPERATIONAL DEFINITIONS OF THE TERMS

The definitions of some of the important terms used in this study are given below:

1. Academic Achievement

i) Knowledge attained or skills developed in the school subjects, usually designated by test scores or by marks assigned by teachers or by both (Good 1973)

ii) Accomplishment or proficiency, performance in a given skill or body of knowledge, progress in school theoretically different from intelligence but overlaps with it to a great degree. (Good 1973)

Measured ability and achievement level of a learner in school subjects or particular skills. (Derek Rowntree 1981)

Refers to performance in school or college in a standard series of educational testing (Teneja 1991)

Accomplishment of specified objectives, past performance and what an individual or organization has accomplished in the past, in contrast with ability which refers to what an individual or organization can do now (in the present) or in future (Madhu Raj 1996 & S.K. Sing 2002).

Successful accomplishment or performance in particular subjects, areas, or courses, usually by reasons of skills, hard work and interest.

Typically summarized in various types of grades, marks, scores or descriptive commentary (John Bellingham, 2004).
A measure of knowledge gained in formal education usually indicated by test scores, grade points, averages, and degrees (Madhu Raj, 1996; John Bellingham, 2004).

2. **Scholastic**

Used to denote relationship with school, for example, scholastic average. Relating to school or school men, pendants (Webster's New Dictionary and Tresaurus, 1975). Of or concerning Universities, schools, education, teachers etc (Della Thompson, 1996)

Pertaining to or characteristic of scholar's education or schools (Britannica Word Language Dictionary 1961)

3. **Achievement**

i) Accomplishment or proficiency of performance in a given skill or body of knowledge.

ii) Progress in school, theoretically different from intelligence but overlaps with it to a great degree (Good 1973)

Refers to the performance in school or college in a standardized series of educational tests (Taneja, 1991)

4. **Academic**

Pertaining to the fields of English, Foreign language, History, Economics, Mathematics and Science. (Good 1973)

i) A scholarly teacher and / or researcher in higher education.

ii) Relating to the school activities especially when concerning a discipline or a subject, not necessarily at higher educational level (Derek Rowntree, 1981)
5. **Achievement Test**

A test designed to measure a person's knowledge, skills, understandings etc in a given field, taught in school, for example a mathematics test or an English test etc (Good 1973)

Refers to a test designed to measure the effects of specific teaching or training in an area of the curriculum. (Taneja 1991)

A standardized test designed to measure and compare levels of knowledge and understanding, in a given subject already learned (John Bellingham 2004)

In the present contest, achievement test means, an objective achievement test (OAT) constructed and standardized by the investigator.

6. **Objective Test**

Any examining device, whose scoring is not dependent upon the discretion of the examiners. In a psychological testing, any test for which the use of subjective judgment, by test scores is virtually eliminated, so that, qualified educators, scoring the test independently, would derive essentially the same scores (John Bellingham 2004)

7. **Personality**

A psychological term that refers to the predictable and unique indicators of the way, an individual might respond to the environment. A personal reference that usually connections acceptability and likeability. (Madhu Raj 1996: John Bellingham 2004).

Personality is that which permits a prediction of what a person will do in a given situation. (Cattell 1970)

The total psychological and social reactions of an individual, the synthesis of his subjective, emotional and mental life, his behaviour, and his
reactions to the environment; the unique or individual traits of a person are connoted to a seller degree by “personality” than by the term “character”.

(Good. C.V. 1973)

For individual all the aspects of behaviour, thought and feeling that make the person unique. For psychologists a major area of theory and research.

(Derek Rowntree. 1981)

8. Personality Trait

A general aspect of a person that may pre-dispose how he or she reacts to particular situations (Madhu Raj, 1996 John Bellingham 2004)

9. Socio-Economic-Status

The background or standing of one or more persons in the society on the basis of both social class and financial situation. (John Bellingham 2004)

The level indicative of both economic positions of an individual or group (Good 1973)

A person’s status or position within the society (or any smaller social group) as determined by social class and wealth or income (Derek Rowntree, 1981).

Refers to a person’s position in any given group society or culture (R.P.Jajena, 1996; & a group of Experts, 2003).

An indicator of an individual or family’s social ranking, based on such factors as level of education, income, neighbourhood of residence or type of occupation (Madhu Raj 1996 & D.R. Ring, 2002).

The background or standing of one or more persons in the society on the basis of both of social class and financial situation (John Bellingham 2004).
10. **Factor**

i) An element in the composition of any thing or in bringing about a certain result.

ii) A fact, which has to be taken into account or which affects the course of events. (Davidson et al. 1998)

11. **Teacher**

A person employed in an official capacity for the purpose of guiding and directing the learning experiences of pupils or students in an educational situation, whether public or private (Good 1973).

12. **Study Habits**

i) The basic features involved in the application of mind to a problem or subject.

ii) The academic pattern which an individual follows in learning about things and people (Good 1973).

The evaluation of pupils behaviour in terms of attitudes, appreciation and habits of work is fundamental to a well-rounded study of outcomes of the teaching (NSSE 1935).

Study habits include student’s habits of concentration, note taking, time budgeting and study methods (Smith, 1961).

The complex of reading behaviour of a person, resulting from the varying degrees of interaction of a number of variable factors. Study habits are regular reading hours and routine characteristics of most of the general features. In preparing for examinations, greater reliance is placed on text books and self prepared text. (Kunchu, 1989).
The techniques, a student employs to go about his or her studies which are consistent and have become stereotyped, as a result of long application or practice (Onubugwu, 1990).

13. Self Concept

An individual's perception of himself, as a person, which includes his abilities, appearance, performance in his job, and phases of daily living (Good 1973).

How a person sees himself (e.g. competent, amusing, homely etc). This may differ from other people's views of him, though they will have influenced it. (Derek Rowntree 1981).

Self-concept refers to the picture or image, a person has of himself (R.P. Taneja 1991 & A group of Experts 2003).

i) An individual's perception of self.

ii) A psychological contact that is more complex, than implied or assumed by most educators. (Madhu Raj, 1996).

14. Class

A group of pupils or students scheduled to report regularly at a particular time to a particular teacher. (Good 1973).

i) A group of students assigned to one or more teachers or other staff members for a given period of time for instruction other activity in a situation where the teacher(s) and students are in presence of each other.

ii) All students in the same grade level such as fifth grade class or tenth grade class.

iii) The group of students who graduate at the same time such as the class X of 1989. (Madhu Raj 1996 & S.K. Sing 2002).
15. Secondary School

Schools with classes VI to X are called high schools or secondary schools in the state of Andhra Pradesh in India. There will be a public examination at the end of VII and X classes in these schools in Andhra Pradesh.

16. Mathematics

One of the compulsory subjects of study from I class to X class in schools of Andhra Pradesh.

Mathematics is the science of numbers and space. Mathematics is the science, which draws necessary conclusions.

Mathematics is a way to settle in the mind a habit of reasoning.

17. Management

For the present study, management means the authority under which the schools function. In this study schools under the authority of Zilla Parishad, Government, municipalities, Andhra Pradesh Social Welfare Department and unaided private, have been considered for present investigation.

18. Locality

The scholastic achievements of students coming from rural areas, villages) semi Urban areas (small towns) and Urban Areas (municipal areas) may differ. Hence students are divided into three groups namely rural, semi urban and urban students and scholastic achievements have been studied. In this investigation locality means rural, semi-urban and urban.

19. Caste

In the present educational system, which is in vogue, in Andhra Pradesh, students are categorized into scheduled castes and scheduled tribes,
back ward castes and other castes not covered under the above two types. In the present investigation the students are divided into three categories basing on their caste, namely SC/ST, BC class and OC students.

20. **Sex**

Male and Female students (boys) and (girls) are considered as sub samples to carry the differential analysis.

21. **Age**

The chronological age of the students as reported by them through the personal data sheet, is considered to divide the sample into three sub groups to study the variations in their achievements.

22. **Size of the family**

It refers to the number of total living members of the family as on the date of collecting the data for the present study.

23. **Sample**

i) A sample possessing the same characteristics as the population with reference to some variables other than, but thought of to be related to, the one under investigation.

ii) Some times used to refer to a stratified sample, in which the sub sample numbers are proportional to the size of the strata (Good 1973).

A sample drawn from a population in such a way that it should (or does) contain members of various categories and classification in the same proportions as they appear in the population. (Derek Rowntree 1981)

Sample refers to a group that is selected from a large group or population for examination with a view to making generalizations about the population, as a whole (R.P. Taneja, 1991).
Sample that corresponds to or matches the population of which it is a part with respect to characteristics important for the purpose under investigation. (Madhu Raj 1996, D.R. Sing 2002 and John Bellingham 2004).

24. **Variable**

Any trait that changes from one case or condition to another, more strictly, the representation of the trait, usually in quantitative form, such as a measurement or an enumeration. (Good 1973).

Refers to a factor in educational research that influences the observation or management of an educational phenomenon (R.P. Taneja, 1991 & a group of experts, 2003).

In educational research, an entity that can vary.

25. **Independent Variable**

i) A variable to which values may be assigned at will.

ii) The variable on which an estimation or prediction is based in a regression problem.

iii) In the plural, often used to refer to variables that are unconnected, when presented graphically, the x-axis or horizontal axis is conveniently used for the independent variable. (Good 1973).

In a statistical study, the variable whose values are deliberately changed (or natural difference observed) in order to see how this influences the values of another variable (the dependent variable). (Derek Rowntree 1981).

Refers to variable whose changes are considered as not dependent upon transformations in other specific variables (R.P. Taneja 1991).
In experimental research, the aspects of the study that the investigator manipulates or controls in order to observe the effect on the dependent variable (Madhu Raj 1996).

An independent variable is one that the researcher manipulates; e.g, a type of instructional programme (John Bellingham 2004).

26. Dependent variable

A dependent variable is one that changes in consequence with changes in the independent variable (John Bellingham 2004).

A variable whose magnitude depends on or is a function of, the value of the another variable (or other variables); a variable whose value is being estimated (for example by regression techniques) from that of one or more independent variables to which it is related; when represented graphically, the y-axis or vertical line is conveniently used or the dependent variable. (Good 1973).

In a statistical study, the variable in whose values, we are expecting to see changes as a result of changes, we have made or observed in the values of some other variable (the independent variable) (Derek Rown Trec, 1981).


A factor in an experimental relationship which has or shows variation that is hypothesized to be caused by another independent factor or variable (Madhu Raj, 1996 & S.K. Sing 2002)

27. Demographics

i) Statistics showing an area’s population characteristics such as age, race, income and education.
ii) Basic information about an individual including such characteristics as age, place of residence and marital status.


28. Regression

i) The tendency for observations that show a high deviation from the mean and a low degree of variability among themselves in regard to one trait to display wider variability and markedly less deviation (on the average) from the mean in a second trait;

ii) The psychological mechanism of retreat from difficulties of adult world of reality to an imaginary world patterned on an earlier, more comfortable mode of life, as in childhood; normally seen in adults as play and make believe;

iii) A movement of the eyes, backward from right to left along the line of type being read;

iv) An error in silent or oral reading in which the reader retracts or goes back over what he has seen reading – Good, 1973).

The term relates to the techniques of analyzing relationships between two or more variables with a view to prediction (or estimating) values of one from values of other(s). (Derek Rowntree 1981).

i) In the context of child development, the temporary lapses or set backs that occur in the otherwise smooth course of normal development.

ii) In the context of learned behaviour or skills, the loss or forgetting of previously learned skills in the absence of opportunities for continued practice.
iii) A psychological withdrawal to an earlier period of life, which may be manifested by infinite or immature behaviour (Madhu Raj 1996, D.R. Sing; 2002).

In the context of child development, the temporary lapses or set backs that occur in the otherwise smooth course of normal development. (John Bellinghom 2004).


A method for describing the nature of relationship between two variables, so that the value of one can be predicted if the value of the other is known. Multiple regression analysis involves more than two variables.

(Madhu Raj, 1996 & D.R. Sing 2002).

3.8 OBJECTIVES OF THE STUDY

1. To understand the present status of X class students with regard to their achievement in mathematics.

2. To study the influence of the variables management, sex and their interaction on the scholastic achievement.

3. To study the influence of locality, caste and their interaction on scholastic achievement in mathematics.

4. To establish a relationship of scholastic achievement with personal variables like age, birth order, education of mother, education of father, occupation of mother, Occupation of father, Income, Religion, Economic status, Size of the family, Work at home, Study hours at home, Separate room for study, and number of hours spent daily for mathematics.
To study the impact of personality factors on the scholastic achievement in mathematics of X class students.

To study the influence of study habits on the scholastic achievement of X class students in mathematics.

To study the impact of self-concepts on the scholastic achievement of X class students in mathematics.

To predict the scholastic achievement of X class students in mathematics with the help of socio-demographic variables, personality factors, study habits and self-concepts, etc.

To predict the scholastic achievement of X class students in mathematics with the help of all independent variables in the investigation.

To develop mathematical equations for predicting the scholastic achievement of X class students in mathematics.

To summarize the findings of present investigation

To make appropriate recommendations on the basis of present findings.

To provide suggestions for further investigation.

**3.9 HYPOTHESES FORMULATED**

On the basis of the above objectives the following major Hypotheses, in the null form are formulated for testing in the present study

1. All the X class students would not have the same scholastic achievement abilities in mathematics.

2. Management, sex and their interaction would not have any significant influence on the scholastic achievement in mathematics of 10th class students.
3. Locality, caste and their interaction would not have any significant influence on the scholastic achievement of X class students in mathematics.

4. Socio-demographic variables would not have any significant impact on the scholastic achievement of X class students in mathematics

5. Personality factors would not have any significant influence on the scholastic achievement of X class students in mathematics

6. Study habits would not have any significant impact on the scholastic achievement of X class students

7. Self-concepts would not have any significant impact on the scholastic achievement of X class students in mathematics

8. It would not be possible to predict the scholastic achievement with the help of socio-demographic variables, personality factors, study habits and self-concepts.

9. It would not be possible to predict the scholastic achievement with the help of all independent variables.

10. It would not be possible to develop mathematical equations with the help of different sets of independent variables.

11. None of the 52 independent variables in this study turns out to be a significant predictor of achievement in mathematics of X class students.

3.10 VARIABLES INCLUDED IN THE PRESENT STUDY

On basis of study of related literature, it has been found that the achievement in mathematics of the students of all classes in general and X class in particular depends on several factors. The investigator has selected the following psycho-sociological variables for the present study.
A. Dependent Variables

The scores obtained by all the subjects (all the students of the sample) in the achievement test, constructed and standardized by the investigator has been taken as dependent variable.

B. Independent Variables

The independent variables studied in this investigation are given below.

1. Personal and socio-demographic variables

The personal and socio-demographic variables included in the present investigation are:

Gender, Caste, Age, Locality, Type of Management, Size of the Family, Birth order, Mothers Education, Fathers Education, Occupation of Father and Mother, Religion, Income of the family, Economic status, Separate room for study, Study hours at home, Help from the family members, Works at home, and Time spent for mathematics in a day.

2. Psychological Variables

The following psychological variables are included in the present study

i) HSPQ consisting of 14 Personality Factors

ii) Study Habits questionnaire consisting of seven areas, and

iii) Self-Concept questionnaire consisting of 10 areas.

3.11 METHOD OF STUDY

The investigator following the scientific principles and procedures of test construction, developed a preliminary objective test with 150 multiple choice questions with the help of senior mathematics teachers for the use of pilot study. The preliminary form is standardized following the method described by Garrette (1973) from pages 365-368 and after deleting fifty questions, a final objective achievement test (OAT) paper is prepared with
one hundred multiple choice questions carrying one mark each. A questionnaire is prepared to collect the necessary information about the pupils regarding their personal characteristics, home background and socio-economic conditions of the family. Cattel's High School Personality Questionnaire (HSPQ) is used to collect the information regarding the personality characteristics of the students of the sample. Study Habits Inventory of Dr. B.V. Patel is adopted to measure the study habits of pupils regarding mathematics. Dr (Miss) Rani Rastogi's Self-Concept Scale is adopted to measure the self-concepts of pupils.

A sample of 1444 students representing all categories of pupils is selected by following the standardized procedures. The necessary data is collected in a planned way and are analyzed using appropriate statistical techniques and the results are interpreted accordingly.

3.12 LIMITATIONS OF PRESENT STUDY

The following are the limitations of the present study.

1. The study is confined to only chittoor district of Andhra Pradesh

2. The study is confined to a few schools (i.e) 22 schools in the four revenue divisions of chittoor district only

3. The study is confined only to the X class students of the above mentioned schools of Chittoor District.

4. The present study concerns itself for the subject of mathematics of X class students only.

5. The effect of only a few independent variables on the achievement in mathematics of X class students has been studied.

6. The achievement scores are taken only from the achievement test constructed and standardized by the investigator

7. The study is based on survey research, where in the techniques of analyzing the data, are based on the questionnaires only
8. The scholastic achievement of X class pupils depends on a number of psychological, sociological, demographic and environmental factors. It is not possible to include each and every factor in this investigation.

9. It is only a presage product study in the area of scholastic achievement.
Chapter - IV

METHODS OF INVESTIGATION