CHAPTER – I

INTRODUCTION

1.01 Introduction

In the present competitive world of scientific technological fast changing societies, it is education that has to determine the Levels of well being and prosperity of the people. Education is considered to be one of the most powerful agencies in shaping the character and determining the future of every individual. It is further regarded as the potential instrument of social transformation and important means of national development. Education is to service, commodity which involves the process of acquisition of knowledge, skills and attitudes which are essential for achieving success in one’s life.

1.02 Education

Taneja (1989) says, Education includes all the processes that develop human ability and behaviour.

John Dewy defines, cited by Khan (1982), education as “the development of all those capacities in the individuals which will enable him to control his environment and fulfil his possibilities.”

Hills (1982) stated that “Education has in most Societies plays two principal roles, that of passing on knowledge from one generation to the next
and that of providing people with skills that enable them to analyse, diagnose and thus question.”

Madhave Rao Scindia (1995) states that “Education has to play a positive, interventionist role in the empowerment of women and disadvantageous groups in imparting necessary skills and in ensuring that every individual can lead a life of his or her choice with dignity and security.”

1.03 Mental Health

Mental Health is not simply a state of happiness or contentment, of outgoingness or accommodation to circumstances, although it may involve these characteristics. To some Mental Health implies living securely, enjoying life, being productive, and having a sturdy ego that is capable of withstanding stress. Others say that these properties are a prerequisite to Mental Health, but not Mental Health itself (Kaplan-1959)

1.03.01 Definitions

Mental Health denotes a state of well being, well mentality, characterized by soundness of thought and outlook, adaptability to one’s environment and balanced behaviour (Barnhart & Barnhart, 1993)

Mental Health is “a state of relatively good adjustment, feeling of well being and actualization of one’s potentialities” (Wolman, 1973)
1.03.02 Mental Health - Theoretical Overview

One set of criteria of Mental Health that appears too much of what people intend by the term is offered by Johoda (1958, 1964). Who was commissioned by the Joint Commission of Mental Illness and Health and proposed six characteristics of the mental by healthy individual.

- The way the individual perceives himself.
- The achievement of self-actualization by becoming what one has the potential to become.
- Integration of personality, including a purpose and meaning in life, tolerance to stress, and ability to recover from setback.
- A realistic perception of the world around him.
- Self autonomy, the ability to be a part of society and still maintain individuality.
- Ability to take life as it become and masters it.

Mental Health is the successful performance of mental function, which results in productive activities, fulfilling relationships with other people and an ability to cope with adversity and adapt to change.

1.03.03 Meaning of Mental Health

Health is a freedom from ailments; it is the general notion about health. Mental Health is like physical health, consists of the absence of serious defects or mental ailments. It is the approach of physician who gives
you a physical Test. He has a check list of defects or ailments considered to be serious. If a person is free from these ailments or symptoms is considered healthy. In considering either physical or Mental Health, such a checklist of ailments would emphasize defects which produce distress or interfere with the larger functions of the individual. Mental Health implies a departure from the normal or undesirable or troubles some departure from the normal.

Another approach to Mental Health is a number of feelings, attitudes or ways of behaving which lead to distress or interfere with larger goals and which are unusual or inevitable. These conditions are abnormal in the sense that there is departure from normal behaviour. This departure from normal is said to be ill Mental Health.

### 1.03.04 Concept of Mental Health and Education

During the present days mental ailments have increased tremendously and have evolved serious problems at the national Level in industrial development, social and economic changes. The problem of Mental Health has acquired importance in the national developmental programmes.

It is difficult to define the term Mental Health comprehensively.

Norm E. Cutts and Nicholas Moseley have defined the term Mental Health comprehensively-
“Mental Health is the ability to adjust satisfactorily to the various strains of the environment; we meet in life and mental hygiene as the Means we take to assure this adjustment.”

In the process of education Mental Health plays significant role. The sound Mental Health is the first condition for the education. Mental Health is most important condition for effective teaching and learning. It is said that “sound mind in sound body”.

The following criteria have been identified of mentally health student or person –

- Possesses socially adaptable behaviours
- He is emotionally satisfied
- He possesses adaptability and resilient mind
- His desires are in harmony with socially approved norms
- He is enthusiastic and reasonable
- He possesses good habits and constructive attitude
- He has insight into his own conduct
- He has own philosophy and values of life
1.04 Scientific Aptitude

1.04.01 Meaning of Scientific Aptitude

A Scientific Aptitude is a potential for acquiring certain skills or knowledge. As such it is used in a far more specific way than intelligence. It also covers areas not included under the umbrella called “Intelligence.”

The educational programme that is devised for any one learner needs to take into account not only his general ability to learn but also any special ability or Scientific Aptitude which he may possess and for which special training should be provided. Scientific Aptitude may be considered to be qualities which all individuals possess in varying degrees. Scientific Aptitude may also be regarded as a special form of superiority in the limited field of performance, for example, science, mathematics or mechanics. Scientific Aptitude is not a special talent, in the same sense that musical aptitude, for example, is thought to be. Scientific Aptitude is the application of general intellectual capacity to scientific materials and problems.

Scientific Aptitude Tests have been developed to predict educability and performance in mechanical and clerical occupations, in engineering, in medicine and law, and in other areas as well. Others in this category are intended to evaluate aptitudes for the study of specific types of subject matter, such as science and mathematics.
Scientific Aptitude Test performance reflects cumulative influences of a multiplicity of experiences and Scientific Aptitude Tests measure the effects of learning under relatively uncontrolled and unknown conditions. Specific Scientific Aptitude Tests also measure “innate capacity” independent of learning.

1.04.02 Characteristics of Scientific Aptitude

- Aptitude can be both innate and acquired.
- Aptitudes generally remain constant.
- Aptitude is not usually unitary but is also pluralistic.
- Rapid learning is positively correlated with high ultimate capacity.
- High aptitude leads to ease in terms of low energy cost per unit of output.
- Interest and satisfaction in the exercise of potential ability are easily developed.
- Aptitudes are relatively specific or at most are related only within small groups.

1.05 Meaning and Nature of Science

Science is a process as well as the product of that process. In its process form it suggests the ways and Means of exploring the truth and in its
product form it presents a systematic and organised body of useful knowledge.

The process form of the science is more important than its product form as the way of exploring the truth and acquiring knowledge is always given more preference in science than the mere memorization or gaining knowledge of the accumulated facts.

The science constantly remains in the search for truth and what it gets on account of this search can never be taken as absolutely and permanently true. These results can be challenged and modified or altered in view of the further explanation and findings. Therefore, science by its nature is always dynamic and not static.

The method or process adopted by science in the explanation of truth is quite unique and distinct from the methods adopted in such study by other subjects. It is known as scientific method and is characterized by the qualities like logically sound, highly valid as well as sufficiently reliable, impartial and objective in its procedure and approach.

Science through its study helps in bringing a typical change in the attitude of its readers and followers. The development of such attitude is known as scientific attitude. The person having such attitude is found to have love for the explanation of truth by adopting true Means for such exploration and “believing in the results of such true findings.”
1.05.01 Characteristics of General Science

General science is “general” for it is free from the traditional boundaries of various areas of science.

- It stands for general education for every individual
- It is not the science of scientist
- It is everyday science for everybody.
- It comprises of correlated, compounded, integrated, interwoven and fused curriculum
- It smashes the walls of compartmentalization
- It serves the purpose of a common man to know himself his environment and be competent to tackle problem of modern world.

General Science occupies a critical position in the Secondary School curriculum. It is required of nearly all pupils. It is the first experience most pupils have with science as a special subject and it may be the only science course that all pupils will take during their secondary School experience.

General Science as its name implies has a broad scope and can be applied to a broad range of interests. It has its own body of subject matter to meet the needs of the pupils.
1.05.02 Importance of Science in School Curriculum

We are living in a new world a period of change and progress and it is getting newer every moment. The present century rightly called as modern age, i.e. science for technological age. The “search for truth” becomes the prosecution of science. The task of science teaching is to provide younger people with the kind of education which will not only provide an understanding of today’s problems but to keep recognize and interpret signals for future. In science there is more new knowledge than old, an imbalance not evident in other teaching fields. Much of new knowledge represents a break with past and whether the new is true remains for future to demonstrate. The sciences particularly suited for an education built upon reasoning and problem solving. It is within the framework of evolving concepts, probabilities and investigation that science can be learned in an honest fashion. Science is future oriented discipline. It grows upon the revision and accumulation of knowledge. There is always effort to refine old ideas to improve modes and theories. Modern world needs an education in the science that is up-to-date and relevant to contemporary life. In many conferences held for science curriculum revision decided to change traditional one.

The science policy resolution of Govt. of India 1958 stated. “The dominating feature of contemporary world is the inter cultivation of science on a large scale and its application to meet the country’s requirements.”
Beside this the Secondary Education Commission, Govt. of India recommended that every Secondary School pupil should study General Science as a compulsory subject, so that he gain a basic quantum of scientific knowledge as a part of his general education.

1.05.03 Science Achievement

It is well known that science is a dynamic and vital force in the daily life of every man and woman. It touches every phase of human activity. The marvellous Achievement in Science has outstripped the limits of the world. A flight to the moon or mars is no longer a new dream. It has almost become impossible to live in this world without scientific knowledge. Its tremendous impact on industry, agriculture and commerce is so great that it is high time that India produced more and more scientifically trained personnel to meet its ever increasing demands in various fields. A good programme of science education shall aim at imparting a sufficient quantum of scientific knowledge in various fields to all and at developing a scientific outlook in them.

Science has played an outstanding role in our life in recent years and is changing our entire existence as health, transportation, communication, power, etc. Therefore, everyone should become familiar with applications and implication of principles of science to be able to live effectively in the
technological world and to be intelligent enough to solve the complicated problems of the society.

The development of science is one of the man’s intellectual achievements. It is a major human activity which explores the realm of human experience; it unfolds the picture of the physical world enabling him to extend his knowledge and to exercise some control over his environment. In consequence, it is possible for him to reduce poverty, disease and other burdens which were once regarded as inevitable.

The modern world required men with scientific training. In every country the departments of agriculture, education, health, police, post and telegraph, railways and survey, employ scientists. These departments send out information to be carried out by officials, merchants, farmers, etc. If these officials do not understand the spirit of scientific information they will fail to do their job properly. Therefore, a basic knowledge of science is important to everybody.

In a competitive world of today, the quality of performance especially in science is mainly responsible for personal progress. Parents wish that their children should achieve high as they are of the opinion that only a very high Level of science achievement will help them to get well placed in life.
1.06 Need and Importance of the Study

Science education is not merely meant to give the pupils a quantum of knowledge, but it also aims at the inculcation of the spirit of enquiry and the habit of investigation in the minds of future citizens of India.

Science as a historical movement has provided man with ideas and practices which have become the chief distinguishing features of modern civilization. The man is modern because he possesses science. Education in scientific theory can be regarded as the teaching of a new language. To be truly literate in the modern age means that a person should be familiar with vocabulary of science too.

The most important aspect of science education is that it satisfies one’s need to be creative. In science there are various Levels of creativity ranging from that of the School boy who finds out a technique for measuring the volume of a stone by measuring the volume of water it displaces to that of Einstein who formulated the theory of relativity.

The term “academic achievement” refers to the identifiable operations, a student is expected to perform on the materials of the course, namely, facts, theories, principles, generalizations, problems and points of view which he encounters, while taking it.

General science is more than the different branches of science put together. The most important reason for teaching general science in Schools
is to make the children become aware of the oneness of all scientific knowledge. According to Rutherford, cited by Seetharaman (1973), “Scientists are not dependent on the ideas of a single man, but on the combined wisdom of thousands of men and women all thinking of the same problem and each doing his or her little but to add to the great structure of knowledge which is gradually being created”.

India a developing country is concerned with maximising the science achievement of all children. The need for universal scientific literacy has been felt in India as much as in any other corner of the globe. The lifestyle of every individual on earth is affected to some degree by aspects of this field of human endeavour. The all pervasive influences of science, makes science a compulsory and indispensable part of the totality of fields that education seeks to address. A university system without sections that offer education in science, is now unthinkable, secondary Schools in all countries give a high priority and status to science education. In a multicultural and multilingual society like ours, science could well serve as a unifying force providing a common culture for all.

The modern civilization is a scientific civilization. This is an age where the modern society is completely drawn into the scientific environment and science has become an integral part of our life and living. Now, we cannot think of a world without science. The wonderful achievements of science have glorified the modern world. In the words of
whitehead (1929) “The great conquerors from Alexander to Caesar and from Caesar to Napoleon, influenced profoundly the life of the subsequent generations. But the total effect of this shrinks to insignificance if compared to the entire transformation of human habits and human mentality produced by the long line of men of thought from Hales to the present day.”

A citizen of a modern world sees the countless manifestations of science all around him. There is no aspect of man’s life today which has not been influenced by science one way or the other. This is because we are living in an age of scientific culture. Science has shrunk the world and totally changed the human outlook. In fact, science now has an all pervading influence on every sphere of human activity. Further, modern science is no longer confined to the surface of this globe its sphere of achievements reaches beyond the earth

Scientific Aptitude is described being presumably largely an intellectual matter. It seems that battery of Tests for the selection of promising scientists will stress such factors as reasoning, spatial visualisation, Numerical Ability, scientific vocabulary and scientific information. Measurement of Scientific Aptitude is attractive because it enables identification of people with special abilities.

In the field of education, Scientific Aptitude Tests are used principally for guidance and classification. Multiple aptitude batteries and differential
prediction have been helpful in making students become aware of educational and vocational possibilities, with the increased use of computers for complex analysis of data. According to Freeman (1979), achievement itself in any area of learning can be considered an indication of an individual’s Scientific Aptitude. A high School or college student who shows superior ability in science, in mathematics, or in writing, for example, may be expected to be exhibiting a high degree of Scientific Aptitude in one or another particular filed. Success in any one field, however, usually is predicated upon many factors beside the possession of a specific ability. Personal attributes and attitudes are likely to advance or to retard successful achievement.

Aptitude Tests measure the innate, acquired or developed component of competency in knowledge, understanding and attitude used in doing certain kind of work at a particular Level (Toplis, 1991). Aptitude may be physical or mental; the innate nature of aptitude is in contrast to achievement, which represents knowledge that is gained through learning. (Carr, 2004)

Aptitude breaks mental ability down into different characteristics, which are supposed to be more or less independent of each other; it is forward looking as it predicts the potential for future ability to learn a skill or set of skills in a candidate. Aptitude confirms present abilities and potentials to learn and cope with new situations in the future. The difference
between aptitude Test and achievement Test (which include numerical and verbal ability Tests) is majorly that, while aptitude Test outcomes are used as predictors of future performance, on the other hand, achievement Tests are only ‘revealers’ of present performance after learning. Compared to achievement Tests, aptitude Tests cover a broader area and look at other range of experiences.

Achievement Tests are closely tied to particular School subject. Aptitude Tests tell us what a student brings to the task regardless of the specific curriculum that the student has already experienced. The difference between aptitude Test and achievement Tests is sometimes a matter of degree, some aptitude and achievement Tests look a lot alike. Generally all Tests are used for the following purpose; selection, admission and certification. If the student scores in verbal and Numerical Ability Tests significantly predict the score in aptitude Test, it then mean that verbal and Numerical Ability Tests can be validated using a good aptitude Test. This will be a significant contribution of this study to knowledge apart from providing empirically-based suggestion for students to develop high verbal and numerical skills in order to do well in aptitude Test.

But at the same time the students of such group are facing lot of pressure and stress from various quarters. Hence proper learning environmental facilities in the School and home are not up to the School students. Further parental inclination towards peer group students influence
also cause stress in the minds of high school students. With the result of all these factors the Achievement in Science are generally affected. Therefore the investigator is keen on studying high School Students Achievement in Science as related to selected variables

1.07 Statement of the Problem

The problem chosen for the study may be stated as follows; “A Study on Mental Health and Scientific Aptitude of high school students in relation to their Achievement in Science”

1.08 Definition of the Terms Used

Mental Health

Mental Health stands for the health of the mind as Carter V. Good in the dictionary of education termed it as “the wholesomeness of the mind” analogous of the wholesomeness of the body implicit in physical health. Accordingly, Mental Health is concerned with the one’s mind and its functioning in the same way as the physical health is concerned with the health of one’s physical organs and their functioning.

Scientific Aptitude

Freeman (1979) defined, Scientific Aptitude as the application of general intellectual capacity of scientific materials and problems. A Test of Scientific Aptitude, therefore, is a device to predict probability of success in scientific studies and occupations without implying that is measures
psychological functions that are essentially different from those required in other types of mental activity.

Aptitudes of the students to decide future education (Chatterjee, 2007) varies from individual to individual that indicates individual’s interests and learning ability (Ramsay, 2008), the specific ability needed to facilitate learning a job, aptness, suitability, readiness, tendency, or natural or acquired disposition or capacity for a particular activity (Reeves, 2002), degree of readiness to learn and perform well in a particular situation or in a fixed domain

Science Achievement

Dictionary of Education (Good, 1959) defines achievement as “accomplishment or proficiency of performance in a given skill or body of knowledge” and academic achievement is defined as “knowledge attained or skills developed in a School subject, usually designated by Test scores by marks assigned by teachers, or by both”.

According to International Encyclopaedia of Education (Paul, 1990), achievement refers to the following.

i) General term for the successful attainment of some goal requiring a certain effort.

ii) The degrees of success attained in a task, e.g., solving a Test.
A number of investigators in India have used the marks secured in science subject by the students in their final School examination in a particular course of study as a valid index of science achievement.

Science Achievement is the measure of what and how much the pupils have learnt as a result of formal or informal instruction in science subject.

1.09 Objectives of study

The following are the objectives of the present study:

1. To find out the Mental Health of high school students
2. To assess the Scientific Aptitude of high school students
3. To find out the Level of Reasoning of high school students
4. To find out the Level of Numerical Ability of high school students
5. To find out the Level of Science Information of high school students
6. To find out the Level of Science Vocabulary of high school students
7. To study the Achievement in Science of high school students
8. To find out whether there is any significant difference in Mental Health among the high school students in respect of the following variables
   a) Gender
   b) Religion
   c) Students Residence
   d) Father’s Education
   e) Father’s Occupation
   f) Mother’s Education
   g) Mother’s Occupation
   h) Parents Income per month
9. To find out whether there is any significant difference in Scientific Aptitude among the high school students in respect of the following variables
   a) Gender b) Religion
c) Students Residence d) Father’s Education
e) Father’s Occupation f) Mother’s Education
g) Mother’s Occupation h) Parents Income per month
i) Total No. of Members in a Family j) Type of School

10. To find out whether there is any significant difference in the Level of Reasoning among the high school students in respect of the following variables
    a) Gender b) Religion
c) Students Residence d) Father’s Education
e) Father’s Occupation f) Mother’s Education
g) Mother’s Occupation h) Parents Income per month
i) Total No. of Members in a Family j) Type of School

11. To find out whether there is any significant difference in the Level of Numerical Ability among the high school students in respect of the following variables
    a) Gender b) Religion
c) Students Residence d) Father’s Education
e) Father’s Occupation  f) Mother’s Education

g) Mother’s Occupation  h) Parents Income per month

i) Total No. of Members in a Family  j) Type of School

12. To find out whether there is any significant difference in the Level of Science Information among the high school students in respect of the following variables

a) Gender  b) Religion

c) Students Residence  d) Father’s Education

e) Father’s Occupation  f) Mother’s Education

g) Mother’s Occupation  h) Parents Income per month

i) Total No. of Members in a Family  j) Type of School

13. To find out whether there is any significant difference in the Level of Science Vocabulary among the high school students in respect of the following variables

a) Gender  b) Religion

c) Students Residence  d) Father’s Education

e) Father’s Occupation  f) Mother’s Education

g) Mother’s Occupation  h) Parents Income per month

i) Total No. of Members in a Family  j) Type of School

14. To find out whether there is any significant difference in Achievement in Science among the high school students in respect of the following variables
15. To find out whether there is any significant relationship between Achievement in Science and Mental Health of the high school students in respect of the following variables

(a) Gender  (b) Religion
(c) Students Residence  (d) Father’s Education
(e) Father’s Occupation  (f) Mother’s Education
(g) Mother’s Occupation  (h) Parents Income per month
(i) Total No. of Members in a Family  (j) Type of School

16. To find out whether there is any significant relationship between Achievement in Science and Scientific Aptitude of high school students in respect of the following variables

(a) Gender  (b) Religion
(c) Students Residence  (d) Father’s Education
(e) Father’s Occupation  (f) Mother’s Education
(g) Mother’s Occupation  (h) Parents Income per month
(i) Total No. of Members in a Family  (j) Type of School
17. To find out whether there is any significant relationship between Achievement in Science and Level of Reasoning of high school students in respect of the following variables

   a) Gender  
   b) Religion  
   c) Students Residence  
   d) Father’s Education  
   e) Father’s Occupation  
   f) Mother’s Education  
   g) Mother’s Occupation  
   h) Parents Income per month  
   i) Total No. of Members in a Family  
   j) Type of School

18. To find out whether there is any significant relationship between Achievement in Science and Level of Numerical Ability of high school students in respect of the following variables

   a) Gender  
   b) Religion  
   c) Students Residence  
   d) Father’s Education  
   e) Father’s Occupation  
   f) Mother’s Education  
   g) Mother’s Occupation  
   h) Parents Income per month  
   i) Total No. of Members in a Family  
   j) Type of School

19. To find out whether there is any significant relationship between Achievement in Science and Level of Science Information of high school students in respect of the following variables

   a) Gender  
   b) Religion  
   c) Students Residence  
   d) Father’s Education  
   e) Father’s Occupation  
   f) Mother’s Education
20. To find out whether there is any significant relationship between Achievement in Science and Level of Science Vocabulary of high school students in respect of the following variables:

   a) Gender            b) Religion
   c) Students Residence d) Father’s Education
   e) Father’s Occupation f) Mother’s Education
   g) Mother’s Occupation h) Parents Income per month
   i) Total No. of Members in a Family j) Type of School

21. To study the variables which discriminate the under achievers, normal achievers and over achievers

1.10 Hypotheses of the Study

The following are the hypotheses of the present study:

1. The Mental Health of high school students is low.
2. The Scientific Aptitude of high school students is low.
3. The Level of Reasoning of high school students is low.
4. The Level of Numerical Ability of high school students is low.
5. The Level of Science Information of high school students is low.
6. The Level of Science Vocabulary of high school students is low.
7. The Achievement in Science of high school students is low.
8. There is no Significant difference in Mental Health among the high school students in respect of the following variables
   a) Gender  b) Religion
   c) Students Residence  d) Father’s Education
   e) Father’s Occupation  f) Mother’s Education
   g) Mother’s Occupation  h) Parents Income per month
   i) Total No. of Members in a Family  j) Type of School

9. There is no Significant difference in Scientific Aptitude among the high school students in respect of the following variables
   a) Gender  b) Religion
   c) Students Residence  d) Father’s Education
   e) Father’s Occupation  f) Mother’s Education
   g) Mother’s Occupation  h) Parents Income per month
   i) Total No. of Members in a Family  j) Type of School

10. There is no Significant difference in the Level of Reasoning among the high school students in respect of the following variables
    a) Gender  b) Religion
    c) Students Residence  d) Father’s Education
    e) Father’s Occupation  f) Mother’s Education
    g) Mother’s Occupation  h) Parents Income per month
    i) Total No. of Members in a Family  j) Type of School
11. There is no significant difference in the level of numerical ability among the high school students in respect of the following variables:

a) Gender       b) Religion

c) Students Residence   d) Father’s Education

e) Father’s Occupation   f) Mother’s Education

g) Mother’s Occupation   h) Parents Income per month

i) Total No. of Members in a Family   j) Type of School

12. There is no significant difference in the level of science information among the high school students in respect of the following variables:

a) Gender       b) Religion

c) Students Residence   d) Father’s Education

e) Father’s Occupation   f) Mother’s Education

g) Mother’s Occupation   h) Parents Income per month

i) Total No. of Members in a Family   j) Type of School

13. There is no significant difference in the level of science vocabulary among the high school students in respect of the following variables:

a) Gender       b) Religion

c) Students Residence   d) Father’s Education

e) Father’s Occupation   f) Mother’s Education

g) Mother’s Occupation   h) Parents Income per month

i) Total No. of Members in a Family   j) Type of School
14. There is no significant difference in achievement in Science among the high school students in respect of the following variables:
   a) Gender  
   b) Religion  
   c) Students Residence  
   d) Father’s Education  
   e) Father’s Occupation  
   f) Mother’s Education  
   g) Mother’s Occupation  
   h) Parents Income per month  
   i) Total No. of Members in a Family  
   j) Type of School

15. There is no significant relationship between achievement in Science and Mental Health of high school students in respect of the following variables:
   a) Gender  
   b) Religion  
   c) Students Residence  
   d) Father’s Education  
   e) Father’s Occupation  
   f) Mother’s Education  
   g) Mother’s Occupation  
   h) Parents Income per month  
   i) Total No. of Members in a Family  
   j) Type of School

16. There is no significant relationship between achievement in Science and Scientific Aptitude of high school students in respect of the following variables:
   a) Gender  
   b) Religion  
   c) Students Residence  
   d) Father’s Education  
   e) Father’s Occupation  
   f) Mother’s Education  
   g) Mother’s Occupation  
   h) Parents Income per month
There is no significant relationship between Achievement in Science and Level of Reasoning of high school students in respect of the following variables:

a) Gender  
b) Religion  
c) Students Residence  
d) Father’s Education  
e) Father’s Occupation  
f) Mother’s Education  
g) Mother’s Occupation  
h) Parents Income per month  
i) Total No. of Members in a Family  
j) Type of School

There is no significant relationship between Achievement in Science and Level of Numerical Ability of high school students in respect of the following variables:

a) Gender  
b) Religion  
c) Students Residence  
d) Father’s Education  
e) Father’s Occupation  
f) Mother’s Education  
g) Mother’s Occupation  
h) Parents Income per month  
i) Total No. of Members in a Family  
j) Type of School

There is no significant relationship between Achievement in Science and Level of Science Information of high school students in respect of the following variables:

a) Gender  
b) Religion  
c) Students Residence  
d) Father’s Education
20. There is no significant relationship between Achievement in Science and Level of Science Vocabulary of high school students in respect of the following variables:

- a) Gender
- b) Religion
- c) Students Residence
- d) Father’s Education
- e) Father’s Occupation
- f) Mother’s Education
- g) Mother’s Occupation
- h) Parents Income per month
- i) Total No. of Members in a Family
- j) Type of School

21. The independent variables selected are correctly discriminating the under achievers, normal achievers and over achievers with respect to their Achievement in Science.

### 1.11 Delimitations of the Study

The present study is restricted to

- IX standard English Medium students of Puducherry
- The demographic variables like Gender, Religion, Students Residence, Father’s Education, Father’s Occupation, Mother’s Education, Mother’s Occupation, Parents Income per month, Total Number of members in the family and Type of School.
1.12 A Brief Resume of the Succeeding Chapters

The introductory chapter (Chapter-I) brings out the need for the study of the present problem and also deals with its significance. Further, it gives the definitions of the key terms used in the study. The objectives as well as the hypotheses developed are also given along with delimitations of the study.

Chapter II contains a brief review of related studies carried out. Chapter III describes the design of the study under different heads – such as method, tools and sample, the construction and administration of the various tools used in the study.

Chapter IV describes the analysis and interpretation of the data obtained by administering the tools.

In Chapter V the major findings of the present investigation are reported with recommendations and suggestions for further research.

Bibliography is presented after Chapter V followed by appendices.