CHAPTER I

CONCEPTUAL BACKGROUND

1.1 INTRODUCTION

Education has remained ever the greatest source of evolution of man’s history. Man—the best in the creation has always been intending to acquire more and more knowledge to make him prosperous, probing and innovative.\textsuperscript{10}

Education is a process through which human personality develops. It is not a temporary process which begins at a definite time and comes to an end at a particular point in the life of man. The word ‘education’ makes it clear that this process is broad based. From birth up to death we come in contact with many things, persons, institutions and ideas.

Education develops personality of an individual in all fields and aspects making him intelligent, learned, bold, and courageous and possessing strong good character, on the other hand it contributes to growth and development of the society. It is only through education that moral ideas and spiritual values, as aspiration of the nation and its cultural heritage is transferred from one generation to another for preservation, purification and sublimation into higher and higher achievements.

With the growth and development of individual, the society also develops to higher and higher levels of attainments. Thus education is essential for the growth and development of individual as well as society.\textsuperscript{11}

Etymologically the word education has been derived from different Latin words.

\begin{itemize}
  \item a) \textit{‘educare’} meaning ‘\textit{to bring out}’ or ‘\textit{to nourish}’.
  \item b) \textit{‘educere’} meaning ‘\textit{to lead out}’ or ‘\textit{to draw out}’.
  \item c) \textit{‘educatum’} meaning ‘\textit{act of teaching}’ or ‘\textit{training}’.
\end{itemize}

Mahatma Gandhi says “By education I mean all-round drawing out of the best in man-body, mind and spirit”

Rabindranath Tagore says “education enables the mind to find out the ultimate truth, which gives us the wealth of inner light and love and gives significance to life”

Education is a means to promote the inherent power and to help in acquiring all sorts of experiences to shape the ability of human behaviour.\(^\text{12}\)

### 1.2 NATURE OF EDUCATION

Science is a systematic and formulated knowledge. Science of education has a systematic body of knowledge on principles of education. It is a branch of knowledge or an organised body of the knowledge that has been accumulated through scientific methods. Education is a thing in which human skill is exercised. We have therefore two aspects of education as,

i, education in theory,

ii, education in practice.

On the one hand, we have educational theorists or an educational scientist; on the other, we have educational artists- the teacher. Both are involved in a same process. So education is a science as well as art.\(^\text{13}\)

### 1.3 NEED OF EDUCATION

Education is able to instil in the child a sense of maturity and responsibility by bringing in him the desired changes according to his needs and demands of ever changing society, of which he is an integral part. Speaking more frankly, education bestows upon the child immense benefits. It brings up the child as the parents do. It guides him like an affectionate father and serves him faithfully like a wife. A well educated person is known all over the region. He is able to meet the conflicting challenges and tide over all the difficulties which confront him in day to day living. Thus, education colourises the individual and helps him in his needs all over the world. Thus, education develops the individual like a flower which distributes its fragrance all over the environment. In this sense, education is that conducive process

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which drags a person from darkness, poverty and misery by developing his individuality in all its aspects - physical, mental, emotional and social.

Just as, on one hand, education develops to full the personality of an individual in all fields and aspects making him intelligent, learned, bold, courageous and possessing strong good character much in the same way, on the other hand, it contributes to the growth and development of society also. It is only through education that a moral ideal and spiritual value, the aspiration of the nation and its cultural heritage is transferred from one generation to another for preservation, purification and sublimation into higher and higher achievements. In other words, with the growth and development of the individual, the society also develops to higher and higher levels of attainments. Thus, education is essential for the growth and development of individual as well as society.  

1.4 ORIGIN OF SCIENCE

Science as it is known today is of relatively modern origin, but the traditions out of which it has emerged reach back beyond recorded history. The roots of science lie in the technology of early tool making and other crafts, while scientific theory was once a part of philosophy and religion. This relationship, with technology encouraging science rather than the other way around, remained the norm until recent times.

Even tough India is not considered as a science-oriented nation, science is not new to the Indian soil. Its signal contribution is not realms of philosophy, ethics and religion have masked its significant quality. Certain Vedas and the Upanishads are replete with scientific information. There are references to the origin of the universe, the concept of atom, medical herbs and so on. Therefore, science is not a new subject for us. The development of science and technology has changed our lifestyle.  

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1.4.1 Meaning of Science

Science is the subject which helps us to draw necessary conclusions and interprets various ideas with useful meaning. The word science has been derived from the Latin word “Scientia” which means knowledge. It is a systematised body of knowledge, which may pertain to any subject or field of life. ‘Science is an organised common sense.’ ‘Science is an interpretation of natural common sense.’ ‘Science is a heap of truth.

Science is the word of the modern age. It is an inseparable part of modern life. Science is not magic but it is human activity without any element of magic. Human beings are curious by nature. The curiosity of man unveils mysteries of nature. With the highly developed mind, man can observe precisely, correlate the results of the observations meaningfully and predict future happenings logically. This ability has helped human beings to intelligently adjust to nature. They explore and change the physical world accordingly to their requirements. The process of observing, describing, exploring and using the physical world is nothing but Science. So Science is compounded of curiosity, observation and thought.

Science is viewed by a common man as a body of scientific information. To a scientist, it is a method by which hypotheses are tested. But to a philosopher it is a way of questioning the truthfulness of knowledge. The term Science is etymologically synonymous with knowledge. It does not imply that all knowledge is Science. But Science is knowledge acquired in a particular way. So Science is truth and search for truth. 16

1.4.2 Definition of Science

Like life, it is comparatively easier to experience Science than to define it. There are perhaps as many definitions of Science as there are scientists.

According to Fitzpatrick, Science is a cumulative and endless series of empirical observations which results in the formation of concepts and theories, with both concepts and theories being subject to modification in the light of further

empirical observations. Science is both a body of knowledge and the process of acquiring and refining knowledge.

Dr. F.R. Schlessinger defines, “Science is a process of the human intellect. It is a way of thinking, a way of doing, a method of discovering new relationships in the physical and biological universe. It is also the product of the process.”

According to Gilbert Archey, Science is knowledge acquired in a particular way. It becomes a human activity, an attitude and an exercise of the mind that put us as it were in a state of familiarity with nature.

Conant defined Science as “An interconnected series of concepts and conceptual schemes that have developed as a result of experimentation and observation and are fruitful of further experimentation and observation”.

These definitions emphasises three basic principles of the nature of Science.

1. Science is a body of knowledge.
2. Science is a method of enquiry, a way of investigation.
3. Science is an attitude towards life.¹⁷

Albert Einstein said, “Science searches for relation, which are thought to exist independently of the searching individual.”

Whitehead (1928), the famous philosopher defines Science as “an attempt to systematize our knowledge of the circumstances in which recognition occurs.”

B.F.Skinner— “First of all. Science is a set of attitudes. It is a disposition to deal with facts rather than with what someone ha said about them.”¹⁸

1.4.3 Nature and Characteristics of Science

Nature of Science

1. It helps in developing and fostering the scientific attitude, scientific interest and scientific outlook among children by providing solutions for day to day problems.

2. It helps in training the children for developing scientific temper and creativity.

3. It helps in building the self-confidence, and systematic approach to day-to-day problems.

4. It explains the natural phenomenon on the basis of established laws of nature.

5. It is both product and process.

6. It constantly remains in search of truth. It adapts scientific method which is known as reliable, valid, objective, unbiased and verifiable.

Therefore, it is true to say that the science is ‘an overall product of human activity in the form of a systematic and organised body of knowledge’. 19

**Characteristics of Science:** According to Show Alter and others

1. Science is empirical;

Observation→Process→Concepts

2. Science grows through processes of science.

3. Scientific knowledge is replicable and tentative in nature.

4. Scientific knowledge is holistic and humanistic.

5. Scientific knowledge is unique as it differs from area of knowledge.

6. Science has its own values of objectivity, rationality and neutrality. 20

**1.4.4 Scope of Science**

Anything that is outside the boundaries of senses of human beings is outside the limits of science. In other words, the scope of science includes everything within the realm of the senses of human beings.

Science deals with the natural world, the realm of nature, matter and energy.

It is not limited to only what is observable. 21

Science and Social Science are complementing each other. While archaeologists are gaining new insight from the advances made in chemistry, science has ushered in changes in areas like transportation, communication, etc. 22

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1.5 ATTITUDE; MEANING AND DEFINITION

Attitude may be taken as predisposition or determining acquired tendencies which prepare a person to balance in a certain way towards certain specific objects or class of objects, subject to the conditions prevailing in the environment. It is a predisposition or tendency to behave in a particular and definite way to a particular situation.

It is derived from the Latin word ‘Aptus’. It has on one hand the significance of fitness or connotes a subjective or mental state of preparation for action. It is a part of individual’s personality. Attitude is “a condition of readiness for a certain type of activity.”

According to Woodworth (1994) “An attitude is a set of disposition, (readiness, inclination, and tendency) to act towards an object according to its characteristics so far as we are acquainted with them”. Various authors have defined attitude in the following ways:

Travers “an attitude is a relation to respond in such a way that behaviour is given a certain direction.” (1973, p. 337)

Meckeachie and Doyle “we define an attitude as an organization of concepts, beliefs, habits and motives associated with a particular object. (1966, p. 560)

Sorenson “an attitude is a particular feeling about something. It therefore involves a tendency to behave in a certain way in situations which involve that something, whether person, idea or object. It is partially rational and partially emotional and is acquired, not inherent, in an individual.” (1977, p. 349)
Whittaker “an attitude is a predisposition or readiness to respond in a pre-determined manner to relevant stimuli.” (1970, p. 591)

1.5.1 Nature and Characteristics of Attitude

Although attitude is a predisposition or determining tendencies to respond in a specified manner, predispositions like habits, interest, traits and psychological motives cannot be classified as attitude. Thus for a more clear distinction, an attitude should meet the following six criteria:

i. **Attitudes have a subject-object relationship:** Attitude always involve the relation of an individual with specific objects, persons, groups, institutions and values or norms related to his environment.

ii. **Attitudes are learned:** - Attitude are learned and acquired dispositions. They are not innate and inherent in an individual. Consequently, they may be differentiated from psychological motives.

iii. **Attitudes are Re-actively enduring states of readiness:** - Attitude represents the state of readiness to respond to a certain stimulus. Psychological motives also do the same. But in their case like hunger and sexual tension, the states of readiness disappear for a period when they are gratified. Attitudes on the other hand, are relatively enduring states of readiness.

iv. **Attitudes have motivational-affective characteristics:** - Attitude has definite motivational characteristics. Other dispositions like habit of writing with right hand do not have any motivational or effective quality; but attitude towards one’s family, nation, religion or other sacred and hallowed institutions have definite motivational characteristics.

v. **Attitudes are as numerous and varied as the stimuli to which they respond:**- Attitude is an implicate response, therefore it stands to be varied with the number and variety of the responses which the individual makes. The change in environment and the situations further bring variety in the expression of these attitudes. Therefore, it is correct to say that attitudes are as numerous as the object towards which they are directed and the situations in which they are expressed.

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vi. **Attitudes range from strongly positive to strongly negative:** Attitudes involve direction as well as magnitude. When a person shows more tendencies to approach an object is said to have positive attitude towards it but when he shows tendency to avoid the object, his attitude is described as negative.²⁵

### 1.5.2 Types of Attitude: - Attitudes are generally classified as follows:

1. **Positive Attitude:** When a person likes and accepts an object, person, activity or thought and is attracted towards it and tries to adjust himself according to that object, person or thought, it is called his positive attitude towards that object, person, activity or thought.

2. **Negative Attitude:** When a person dislikes and rejects an object, activity or thought, it is called his negative attitude towards such object, person, activity or thought.

3. **General Attitude:** the attitude which is expressed in general or collective term towards an object, person, activity or thought is called general attitude, such as motherly affection towards women.

4. **Specific Attitude:** The attitude which is specifically expressed towards an object, person, thought or activity is called specific attitude; such as, specific love and devotion to one’s own mother.²⁶

### 1.5.3 Factors Influencing Attitude

Attitude is unquestionably an acquired disposition and therefore conditioned by learning or acquisition of experiences. Heredity factor does not play any role in the formation or development of attitudes. The factors influencing the formation and development of attitudes can be divided into two parts as follows:

A. **Factors within the individual himself**

i. Physical growth and development.

ii. Intellectual development.

iii. Emotional development.

iv. Social development.

v. Ethical and moral development.

B. Factors within the individual’s environment
i. Home and family, and
ii. Social environment.

Attitudes are by no means fixed. Consequently they may be changes through acquisition of new experiences.

1.5.4 Measurement of Attitude

We have defined attitudes as implicit responses or predispositions to objects, persons, ideas, values or situations in the social surroundings. Thereby they are essentially covert tendencies. If we want to measure them, there must be some means to draw them out or make them manifested in the form of overt behaviors. This can be done in following two ways:

1. Direct Method: - In this method, opinion of an individual about a particular subject in the form of verbal report is collected and based on this; his attitude towards the subject is estimated generally devices are used for this purpose.

i. Asking the individual directly how he feels about the subject. (questioning and interview technique)

ii. Asking to mark those statements from a list with which he is in agreement.(Check list, etc.)

iii. To indicate his degree of agreement or disagreement with a series of statements dealing with the same subject. (Attitude scales)

The last mentioned devices known as attitude scales, are most widely used for the measurement of attitudes. Generally the following two types of scales are popular:

A. Thurstone’s Attitude Scale: - These are also known as equal-appearing intervals scales. In constructing such scales, a large number of statements representing a variety of opinions on the subject are collected. These statements are then given to a number of judges who are asked to sort the statements in two categories- say from “very favourable” to “very unfavourable”. Whenever the judges disagree significantly over an item, it is rejected. The finished scale then consists of the remaining statements or items that represent clearly defined opinions on the subject. Each of the final statements is then assigned a scale value based on the median scale position given by the judges.
B. **Likert Attitude Scale**: This scale is more popular than Thurstone’s scale. It employs a larger number of items than Thurstone’s scale and discards the methods of scaling by several judges. In constructing such a scale, a number of statements or items concerning a particular subject are collected. These items, each of which clearly represents either a favourable or unfavourable attitude, are then tested for internal consistency, i.e. to see all the statements or items are actually concerned with the same subject. The tested items constitute attitude scale. The individual is asked to indicate the degree of his agreement or disagreement with each item on a five-point scale. Thus for assessing attitude towards internationalism, the sample items such as follows are presented.

Encircle one of the symbols preceding each of the following statements. A stands for “Agree”, S.A. stands for “Strongly Agree”, D for “Disagree”, S.D. for “Strongly Disagree” and I for “Undecided.”

1. **Indirect Method for Measurement of Attitudes**: The process of inferring attitude directly from the verbal report or expressed opinion has many limitations. One may conceal one’s real attitudes and may not really know what one feels and unable to know one’s attitude about a situation in the abstract. Even overt behavior is not always a true indication of one’s attitude. When politicians cuddle babies their behavior may not be a true expression of their attitude towards children. To avoid this problem, it has been tried to make use of the measurement methods that are indirect or disguised in nature. In these methods the subjects are given opportunities to structure their own responses without letting them know the real purpose of the task. The projective techniques used for the assessment of personality are the good examples of these indirect methods. The essence of these techniques is that the subject expresses his covert tendencies while responding to unstructured stimuli. An intelligent interpretation of these responses may show his attitude towards a particular object or issue.²⁷

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1.6 ACHIEVEMENT

Any dictionary meaning of the term ‘achieve’ would be ‘to accomplish’, ‘to attain successfully’ and so on. This is true in the field of education. The term is referred with respect to the success in the school subjects. Accordingly, achievement is defined as “the degree of proficiency or progress made by pupils in the mastery of school subjects”

It may be defined as – something accomplished successfully, especially by means of exertion, skill, practice, or perseverance. It is the act of accomplishing or finishing.

Achievement in the school or college may be taken to mean any desirable learning that is observed in the student. Since the word ‘desirable’ implies a value judgement, it is obvious that a particular learning may be referred to as achievement or otherwise depending on whether it is considered desirable or not. Any behaviour that is learned may come within the scope of achievement. Learning is not limited to mere acquisition of information but also include attitude, interest, values, etc. Although ‘achievement’ is used in this broad sense it is customary for schools and colleges to be concerned to a great extent with the development of knowledge, understanding and acquisition of skills.28

1.6.1 Factors in Achievement

In a study considering the factors of school achievement, one possibly ignores those aspects in which individuals differ from one another. The starting point may be academic achievement itself where wide ranging variations occur from the point of non-performance to the point of outstanding achievement. If we consider a group of students, a few students are found to be high achievers on the other hand, and a few are low achievers on the other, while a sizable number of students always appear as moderate achievers. Various investigations have explored numerous factors which are found responsible for academic success or failure. Such factors seem to come in two genera heads:

1. Intellectual, and


(1) Intellectual: - Intelligence has been recognized as an inherent quality, with unified and stable characteristics, distributed unequally among individuals. It may be explained as ‘the capacity for knowledge and understanding, especially as applied to the handling of novel situations, the power of meeting a novel situation successfully by adjusting behavior to the total situation.’ In case of school children intelligence is the ability to learn and succeed in school education. Therefore there is a reason to believe that more intelligent pupils could learn more quickly, retain for a longer period of time, perform better in all academic affairs and so could obtain high positions in classes compared to the less intelligent pupils.

(2) Non-Intellectual: - It has been observed that in the absence of intellectual abilities high scholastic achievement is not possible. At the same time mere presence of superior intelligence does not ensure higher achievement. Many empirical studies based on scientific investigation have shown that even pupils of superior intelligence are under-achievers, while some pupils with average intelligence achieve more than what is expected of them. Gowen reported that a sizable proportion of gifted pupils were found to be under-achievers in secondary schools.29

1.7 RATIONALE OF THE STUDY

In modern times, the future of every country depends on scientific and technological development. The study of the subject is very important as the knowledge of science in essential in our day to day life especially in the present era. Generally the quality of science teaching in our schools has been found unsatisfactory.

In Tura, there seems to be a serious drawback in science education. Student shows less interest in science subject and some of them have even developed a negative stereotype of science and scientists by viewing them as nerd or mad scientists.

It is seen that most of the student after passing their X exams opted for arts subject and only few students go for science courses. The reasons for this may vary and many. It may be due to lack of interest in science subject on the part of the students, lack of positive scientific attitude towards the subject, lack of motivation or

encouragement on the part of the parents and teachers. Lack of facilities and equipments may also be a reason.

Often what is taught in the classroom in the name of physical and life sciences is actually divorced from the actual needs and necessities of life. The students after having graduations and post-graduation degrees in science related subjects are hardly able to use the knowledge and skills acquired in meeting their day to day problems. The way science is taught, both at the high school and college level, also plays a major role in shaping students' attitudes toward science.

Thus there lie some basic reasons for the investigator to conduct a study on Attitude towards Science Subject of class IX students of Tura Town and its relation with their academic achievement.

1.8 STATEMENT OF THE PROBLEM

The present study attempted to find out the attitude of class IX students of Tura Town towards science in relation to gender and management. An attempt was made to compare the attitude between students towards science on the basis of sex and management. The relationship between science and achievement in science has also been found out.

Thus the study is title stated as, “A Study of the Attitude of Class IX Students towards Science Subject and its Relation to Achievement in Science in Tura Town.”

1.9 OBJECTIVES OF THE STUDY

1. To find out the Attitude towards Science of Class IX students on the basis of sex and management.
2. To find out the Achievement in Science of Class IX students on the basis of sex and management.
3. To find out the difference between Class IX students in their Attitude towards Science on the basis of
i. Sex

ii. Management

4. To find out the difference between Class IX students in their Achievement in Science on the basis of sex and management.

5. To study the relationship between Attitude towards Science and Achievement in Science.

1.10 HYPOTHESES

Ho 1. There is no significant difference between male and female students of Class IX in their Attitude towards Science.

Ho 2. There is no significant difference between Government and Deficit school students of Class IX in their Attitude towards Science.

Ho 3. There is no significant difference between Government and Private school students of Class IX in their Attitude towards Science.

Ho 4. There is no significant difference between Deficit and Private school students of Class IX in their Attitude towards Science.

Ho 5. There is no significant difference between male and female students of Class IX in their Achievement in Science.

Ho 6. There is no significant difference between Government and Deficit school students of Class IX in their Achievement in Science.

Ho 7. There is no significant difference between Government and Private school students of Class IX in Achievement in Science.

Ho 8. There is no significant difference between Deficit and Private school students of Class IX in their Achievement in Science.

Ho 9. There is no significant relationship between Attitude towards Science and Achievement in Science of Class IX Students of Tura Town.

1.11 DELIMITATION OF STUDY

The investigator had to delimit her study to Tura Town only.
1.12 CONCLUSION

Chapter I discusses the meaning and the term of the study, its needs and significance. It throws light on the areas where the study is conducted. It is the introductory chapter which discusses a conceptual background of the study undertaken by the investigator. This includes the background of the area in which the investigator would study. The Chapter also include the objectives of the study which keep the investigator on the right tract. The next Chapter II deals with review of related literature of the past conducted study both from abroad and India. The third chapter deal with the methodology in conducting the study. The fourth chapter deals with data analysis and interpretation. Chapter V deals with discussions of findings, conclusion and suggestions of the development for further study.