

## CHAPTER I

### CONCEPTUAL FRAMEWORK

*“Good teachers radiate knowledge everywhere. They are unique, divine looking personalities. They inspire the young students and prepare them to face any challenges in life. They instill in them courage, hope, confidence and a sense of victory, values, so that they march on the path of brilliance to achieve their rightful destiny.”*

*Dr. A.P.J. Abdul Kalam*

#### 1.1.0 INTRODUCTION

Education is a powerful instrument of change for the progressive improvement of human being. It has the potential role to play in shaping the destinies of any societies by bringing desired changes among the people. It tends to create a social order based on values of freedom, social justice and equal opportunity and fits a man perfectly for the time. Education in 21<sup>st</sup> century has to meet the emerging needs of mankind, as it progresses from the “local community to a world society”. Due to the explosion of population, advancement in science and technology, knowledge expansion, medical knowledge in curing diseases, industrialization, urbanization, mobilization, IT revolution, globalization, flow of western culture – the present society is rapidly changing and the life is centred round the wonders of science and the material benefits of the physical world. Despite of this advancement in every field, still people are suffering with problems like poverty, pollution, unemployment, depletion of natural resources on one side and on other side they are ignoring basic values like humanity, spirituality, integration etc. Boosting economic development and disregarding the value of education are causing threat to the humanity on the globe. In such situation, people are leading miserable life due to over use or misuse of natural resource, creating environmental pollution, misusing of political power, ill-treatment of women and disabled, corruption, exploitation of children etc. There is a need to produce individuals with rationality, humanity and dynamism and for this, the role of education is vital.

The main function of education is to develop an integrated personality (physical, intellectual, social, vocational, cultural, aesthetic, moral and spiritual development) among the students, inculcating values inherent in the contents of curriculum. There are specific values that an integrated personality reveals through various capacities like,

- the values of health, strength, stamina and discipline show one's physical capacity,
- the values of courage, confidence, love and dedication shows ones emotional capacity,
- the values of clarity, rationality, sobriety and impartiality show one's intellectual capacity,
- the values of honesty, purity, fairness and justice show one's moral and spiritual capacity,
- the values like kindness, politeness, service, fellow feeling show one's social capacity,
- the values of dignity of labour, adaptability, hard working, economic, respect for service show one's vocational capacity.

These values of life led one to a total or complete citizen which would fulfill the aspiration of the society. But our present system of education is isolated from the society and societal needs. The education just provides some factual knowledge which has no practicability to the life. As a result there is an alienation of the youth from himself, his society and his environment. His mind suffers from indecision and his actions are aimless. An almost similar point was sounded by the International Commission on Education set up by United Nations Education Scientific & Cultural Organization (UNESCO) in 1972, which stated the inadequacy of education in these terms, "Education suffers basically from the gap between its content and the living experience of its pupils, between the system of values that it preaches and the goals set up by society, between its ancient curricula and the modernity of science." In this connection, the Report of Radhakrishnan Commission (1948-49) stated that "What we

need is not the imparting of instructions but the transmitting of vitality, the civilization of human heart. Our institutions (schools), if they are to impart religious vitality, should have simplicity and atmosphere of consecration that permanently influences lives. These institutions need to decipher the moral, ethical and humanistic dimensions on one hand and the consequences of materialistic pursuits on the other". Hence, it is felt to have a value integrated education system to impart required values among students through the systematic teaching of different subjects. In the present study, the researcher had made an attempt to inculcate certain values among students through teaching of the subject of Science and Technology.

### **1.2.0 MEANING AND DEFINITIONS OF VALUE**

Values are the guiding principles of life, which are conducive to all round development. Values are those standards or codes of conduct conditioned by one's cultural tenets, guided by conscience, according to which one is supposed to conduct himself and shape his life pattern by integrating his benefits, ideas and attitude to realize the cherished ideals and aims of life.

Values are regarded as desirable, important and held in high esteem by a particular society in which a person lives; values reflect one's personal attitudes and judgments, decisions and choices, behaviour and relationships, dreams and vision. They influence our thoughts, feelings and actions. They guide us to do the right things. According to Venkataiah (1998) "Any human activity, thought or idea, feeling, sentiment, emotion which could promote self development of the individual in all its dimensions could be said to constitute a value."

'Value means something that has a price, something precious, dear and worthwhile. It is something for which one is ready to suffer and sacrifice for. In other words values are a set of principles or standards of behaviour. John Dewey states, "Value means primarily to prize, to esteem, to appraise and to estimate. It means the act of achieving something, holding it and also the act of passing judgment upon the nature and amounts of values as compared with something else". Allport (1969) defines value "a belief upon which a man acts by preference". A value is what is desired or what is sought. Rokeach (1973) defines values as an enduring belief, a specific mode of conduct, or a state of existence. Values are guiding principles of life which lead to all

round development of an individual. They give direction to life. A life without values is like a ship without radar. We can also say that values represent an individual's philosophy in life that guides him in a variety of situations. Values are culture specific, they are closely tied to the culture in which a person lives and works. They guide the behaviour of a person in extreme adverse situations.

### **1.3.0 NATURE AND CLASSIFICATION OF VALUES**

Values are not static in nature. It possess both cognitive and affective dimensions. Values steer our life's journey. Those are modes of organizing conduct. Those are acquired both by consciously and sub-consciously in many ways. Those animate an individual. Those are influenced by emotions. Values can be derived from several sources. Those are felt sometimes partly and sometimes wholly. Anything which has utility has value. Those are quite helpful for survival. Hence, Value is a broad concept. It is further divided into different types like social, personal, national, ethical, moral, aesthetic, etc. National Council of Educational Research and Training (NCERT, 1979) had brought out a document on values in education wherein as many as 83 essential human values were listed alphabetically. They are: (1) Abstinence, (2) Appreciation of cultural values of others, (3) Anti-untouchability, (4) Citizenship, (5) Consideration for others, (6) Concern for others, (7) Cooperation, (8) Cleanliness, (9) Compassion, (10) Common cause, (11) Common goal, (12) Courage, (13) Courtesy, (14) Curiosity, (15) Democratic decision making, (16) Devotion, (17) Dignity of manual work, (18) Duty, (19) Discipline, (20) Endurance, (21) Equality, (22) Friendship, (23) Faithfulness, (24) Fellow feeling, (26) Freedom, (27) Forward Look, (28) Good manners, (29) Gratitude, (30) Gentlemanliness, (31) Honesty, (32) Helpfulness, (33) Humanism, (34) Hygienic living, (35) Initiative, (36) Integrity, (37) Justice, (38) Kindness, (39) Kindness to animals, (40) Leadership, (41) Loyalty to duty, (42) National unity, (43) National consciousness, (44) Non-violence, (45) National consciousness, (46) Obedience, (47) Peace, (48) Proper utilization of time, (49) Punctuality, (50) Patriotism, (51) Purity, (52) Quest for knowledge, (53) Resourcefulness, (54) Regularity, (55) Respect for others, (56) Reverence for old age, (57) Sincerity, (58) Simple living, (59) Social justice, (60) Self-discipline, (61) Self-help, (62) Self-confidence, (63) Self-respect, (64) Self-support, (65) Self-study, (66) Self-reliance, (67) Self-control, (68) Self-restraint, (69) Social service, (70) Solidarity

of mankind, (71) Sense of social responsibility, (72) Sense of discrimination, (73) Socialism, (74) Sympathy, (75) Secularism and respect for all religion, (76) Spirit of enquiry, (77) Team work, (78) Truthfulness, (79) Team spirit, (80) Tolerance, (81) Universal truth, (82) Universal love, (83) Value for national and civic property. (Fernandez, 2002)

Values, in general can be classified broadly under different headings. However, it has to be kept in mind that no rigid boundaries and tight compartments can be observed while categorizing values. Values in different categories tend to overlap each other. Some of them have been discussed below.

### **1.3.1 Personal Values**

These are the values which a person cherishes as his own. This category includes joys, ambitions, possession of pursuits. These values held by the individual are irrespective of his social relationships and interactions. The individual sets his own standards of achievement and attains these targets without any social transactions. Personal values include cleanliness, contentment, courage, creativity, determination, dignity of labour, diligence, excellence, honesty, hope, maturity, regularity, punctuality etc.

### **1.3.2 Social Values**

Social values are those values which are concerned with the society. These values get inculcated as a result of an individual numerous interactions in a social milieu. These values are usually practiced in relation to the community, the society and the world at large. These values percolate down as a result of the political and social ideologies a nation holds. These could also be temporary in nature and change with the change in the social philosophy. Social values include fellow-feeling, unity, brotherhood, responsibility, co-operation, social accountability, service, team spirit, leadership, sharing, tolerance, kindness, patience etc.

### **1.3.3 Universal Values**

Universal values transcend time and space barriers. They are time-tested and have withstood the test of time. In any corner of the universe, these values are practiced

and they are not culture specific. Love, kindness, honesty is all examples of universal values.

#### **1.3.4 Moral Values**

Moral values are those which are related to an individual's character and integrity. They confirm to what is right and wrong. These values are related to the code of conduct of an individual. They indicate a persons control over his self. These values could include honesty, integrity, compassion, discipline, control of the senses, self-restraint, charity etc. Moral values are difficult to define universally as they are culture specific.

#### **1.3.5 Aesthetic Values**

These values are concerned with love for beauty. Finding beauty in the environment around us is an indication of our aesthetic sense. Love for fine arts, love for performing arts like dance, music, theatre, paintings, sculpture, love for nature, love for poetry etc. are all included in aesthetic values.

#### **1.3.6 Spiritual Values**

Here, the focus is on the soul or the spirit of man. In other words it is awareness of the inner-self. It gives an insight to view life in its perspective. It gives us the ability to see falsehood and truth as it is.

### **1.4.0 MEANING AND DEFINITIONS OF VALUE EDUCATION**

Value education is the process by which people transmit values to others. It can be an activity that can take place in *any* organization during which people are assisted by others, who may be older, in a position of authority or are more experienced, to make explicit those values underlying their own behaviour, to assess the effectiveness of these values and associated behaviour for their own and others' long term well-being and to reflect on and acquire other values and behaviour which they recognize as being more effective for long term well-being of self and others. Value education thus, can take place at home, as well as in schools, colleges, universities, jails and voluntary youth organizations.

Wikipedia defines value education as the process that gives young people an initiation into values, giving knowledge of the rules needed to function in this mode of relating to other people, and to seek the development in the student a grasp of certain underlying principles, together with the ability to apply these rules intelligently, and to have the settled disposition.

Cox (1988) distinct between explicit value education and implicit value education where *explicit value education* is associated with those different pedagogies, methods or programmes that teachers or educators use in order to create learning experiences for students when it comes to value questions.

Halstead (1996) defines value education as the learning about self and wisdom of life in a self exploratory, systematic and scientific way through formal education.

### **1.5.0 NEED OF VALUE EDUCATION**

The importance of value education has been duly recognized by different education commissions and committees appointed by the government of India from time to time. During the pre-independence period, the Hartog committee (1929) felt that religious instruction can be given in common schools outside the school hours. The Central Advisory Board of Education (CABE, 1946) felt that religious and moral instruction was important and that should be left to the community to which the pupils belong. After the independence, the Secondary Education Commission's Report (1953) favoured that religious and moral instruction should be given in schools outside the school hours on voluntary basis. Our education system should be value oriented as it was recommended by Sri Prakash Committee on Religious and Moral Education (1959) that moral and religious education should be included in the education system from the elementary to the university stage. Value oriented education includes all the subjects and all the teachers who can correlate their lessons to a higher purpose and meaning in life for their students. Even knowledge is value when it is applied in life. In other words, value oriented education comprising all types of education aesthetic, ethical, health, intellectual, scientific and spiritual. In this process, we can change our old saying i.e. 'Values are to be caught not taught' to 'Values are to be taught and caught'. NCF (2005) has also stressed on peace education in schools of which value education is an integral part.

The main function of education is to produce citizens with sound character and a healthy personality. Good citizens are the only hope of the country. Inspiring values, ideals, proper moral conduct, life based upon good principles is an essential requisite. The ideas of virtue, goodness, true manliness constitute the very essence of real dignified living. In spite of recommendations on value education given by different commissions and committees and the efforts made by education institution to impart value education in schools run by the state and voluntary agencies, the practice of values in the life and in the society is deteriorating day by day.

Value deterioration in the society is a common concern to all educationists. To reestablish these values in Mahatma Gandhi's words to students of Jaffna College, "Head should become a subservient to Heart", may be taken as a dictum to be adhered strictly. In the race for the development of intellect, the educational system forgot the growth of Heart. The materialism dried up the joyful mutual relationship and in the race of accumulation of wealth even the education of "head" has been distorted. It invited corruption and exploitation in social life. Man has become self-centered and seeks happiness in the materialistic world at the cost of the others life which in return gives him tensions, enmity, violence and power craze.

Modernity demands little attention to religion and God but practical real demand of the necessity of faith cannot be out rightly rejected. The religion that inculcates the value of service to humanity and love for all has its significance in the field of education in inculcating these values in students. The secondary level students are in adolescent period which is a period of dreaming and fantasy. The energy in them assures that in a short span of time, they will attain some goal or the other, but they find that lack of power of mental concentration, or non-congenial atmosphere at home and at their place of study are great obstacles which frustrate them. So, out of frustration they become only ordinary citizens or some of them fall into the deep and dirty ditch of the vagabonds, they take to drugs, bad films and such other disorientation and degrading habits.

It has found that, during adolescence, most of the boys and girls have high ideals and have a strong voice of clear conscience that constantly asks them to keep away from bad thing. But when they see their elders telling lies, earning by dishonest means and doing all sorts of negative activities and yet justifying their bad actions, then they get

confused, corrupted and compelled to adopt bad ways of life. So it is the duty of the elders, the teachers and all educational institution to guard against all such roles or saying and doing such things those spoil the adolescents. It is the duty of the society to arrange not only for their secular education but also for such moral and spiritual education, which will give them the power to develop, the power of concentration of mind and the strength of character that can ward off the temptation to which the adolescents fall an easy prey.

Today the teacher has been transformed and converted into a greedy businessman. If all the teachers want to educate their students' heart, first of all they will have to change themselves and get freedom from the clutches of materialism. Public media has also fallen to the materialistic thoughts. It has so polluted our inner climate that a person today has become totally adverse to building of good character, inner personality and a virtue powerful in its impact and influence. In the man of today, the development of the power of resistance against the odds of modern life is needed. It is important to bring in change in educational conceptualization duality has to be subdued if oneness is to be promoted. The society needs love more that it needs concept of equality, kindness and consideration to the suffering people and the concept of trusteeship.

### **1.6.0 COMMISSIONS AND COMMITTEES ON VALUE EDUCATION**

Various commissions and committees in the pre and post independent era have talked about integrating programmes in the school curriculum to inculcate values directly or indirectly among students. Prior to independence, the ruling British Government struck to a policy of strict religious neutrality. The Central Advisory Board of Education (1943-46) recommended the provision of spiritual and moral instruction for building up of the character of the young and said it should be the responsibility of the home and the community. The University Education Commission (1948) recommended moral and spiritual instruction at the university stage too. Moral and religious instruction from the elementary to the university stage was recommended by Sri Prakash Committee on Religious and Moral Education (1959). The committee on Emotional Integration (1961) recommended that 'every student who takes up science should have some background in the humanities and should study a compulsory paper

on Indian Cultural heritage, just as students in humanities should have some knowledge in general science’.

The Education Commission (1964-66) recommended instruction on moral, social and spiritual values at all levels of study. It further stated, “The destiny of India is being shaped in its classrooms”. Our educational system can play a vital role in this regard. Educational institution can impart values to influence human life along with imparting general instruction.

The UNESCO in its report of the International Commission (1972) suggested that educational systems should encourage the promotion of the values of world peace, international understanding and unity of mankind. The NPE (1986) expressed its grave concern over the decline of basic moral values in society in general. It further stressed the need for readjustment in the curriculum in order to make education a forceful tool for the cultivation of social and moral values. It also emphasized on the combative role of value education in helping to eliminate obscurantism, religious fanaticism, violence, superstition and fatalism. NPE (1986) – A Review (1990) stated ‘in recent time there has been a perceptible individual decline of basic moral values. The phenomena acquire a special pungency for us in India, considering our great civilization and heritage. Our education institutes, which have not escaped the impact of its pervasive value decline, have a special responsibility to respond to the situation with great subtlety playing a vital role in value education. It should become an integral part of the entire educational force and school climate’.

The NPE (1986) and Ramamurti Committee Report (1992), observes, “Every country develops its system of education to express and promote its unique socio cultural identity and also to meet the challenges of the times. There are moments in history when a new direction has to be given to an age old process. That moment is today.” NPE has further observed, “Education has an acculturating role. It refines sensitivities and perceptions” and that ‘the educational system must produce young men and women of character and ability committed to national service and development. Only then will education be able to play its vital role in promoting national progress, creating a sense of common citizenship, culture and strengthening national integration.’

The National Curriculum Framework for School Education (NCFSE, 2000) has said that it is imperative for the Indian school curriculum to include inculcation of basic values and an awareness of all the major religions of the country as one of the central components. They have further emphasized that these should be judiciously integrated with all the subjects of study in the scholastic areas and all the activities and programmes in the co-scholastic areas and that the objectives there of would be directly and indirectly achieved in the classroom, at the school assembly place, play grounds, cultural centres and other such places. National Curriculum Framework (NCF, 2005) has stressed on peace education in schools of which value education is an integral part.

It is clear that various commissions and committees have been stressing on the urgent need for integrating different values in the curriculum at all levels.

#### **1.7.0 VALUE DETERIORATION: THE PRESENT SCENARIO**

In India, corruption is rampant and the communalism, separatism, isolation, untouchability, bigotry and exploitation are still going on. We notice that violence, selfishness, black-marketing and beastly tendencies have increased tremendously. India was looted by the foreign rulers during the pre-independence period whereas in the post-independence period we have been looted by our own people. The richness of India is dominated by 5-6% of the rich population whereas most of the Indian people living below the poverty line and this results into earning by any means. Nobody seems neither to care for his own country against his own selfish interests nor seems to be concerned about the present state of India in which dirty and nauseating politics that resulted in the near doom of the country. Our country is also facing crucial problems like growing population, natural calamities, pollution of all sorts and environmental imbalance and we are being stunned by more and more difficult problems almost every day. The youth in India have been in a mood of frustration and confusion and they do not know whom to follow as their ideals. The country does not provide them with a programme which would give youth the opportunities-to-show their strength ability. Due to the lack of constructive programmes, the youth in India are quite prone to march on the way to destructiveness. India is no more a land of action, no more a land of sacrifice, it has turned into a land of the people inclined to

attain their personal gains, and personal enjoyment. It is our duty to make her as before -a land of sacrifice for the worship of humanity.

Further, the population explosion has to a large extent degraded the quality of human life in India. Human life being full of stress and tensions there has been a growing fear in our mind that we are going away from India's cultural treasure as we are being carried away by technological progress. The amazing development achieved by science has enabled man to step into the space, but this has made him a stranger to his next-door neighbour. But the question arise here that, does it mean that we have reached a stage when it has become necessary for man to teach him humanity?

Diwedi (1983) also stated that the post basic schools provide a batter atmosphere in schools to inculcate moral, social and religious values as compared to ordinary schools. It is also found that Values are lost in the present scenario. Rajput (1991) remarked that values of kindness, character, achieving the ideal, service to humanity, fearlessness, purity in personal life, freedom from lust and quest for truth have been lost somewhere in the search of materialistic gains. He further adds that self-control, humility and selfless service find practically no space in school curricula. He further urges that Indian heritage, culture and values need to be thoroughly studied, analyzed and incorporated comprehensively in the educational system of the country right from the initial stage. There is a change in value system in schools and there are changes taking place in social values and their educational implications. 'Apart from educational institutions, values are getting deteriorated by the family atmosphere in present scenario, socio economic status of a child, broken family, family size showed students getting poor adjustment, activism and high personal and materialistic value getting developed instead of true values' (Bhatnagar,1984).

There is deterioration in values and to what extent it has affected our life, especially in the field of education, needs to be examined. Education is a continuous, bi-polar, dynamic development and growth process affecting individual as well as social life. Mahatma Gandhi called it the highest development of body, mind and soul. In the eyes of Swami Vivekananda, it is the expression and unfolding to inner perfections, while Plato limited it to the perfection of body and soul. Herbert Spencer saw in education the adjustment of innate powers in man with the outside world. In one

sentence it can be said that education is a man making process. This man making process needs the inculcation of higher values in man.

The duty of imparting education has become confined only up to schools. The family has ceased to be an institution for cultural, aesthetic and moral education. The school imparts only the subject information and is limited only up to intellectual development. It is squeezed between memory and mechanical machinations. The society has degenerated into exploratory system aiming at materialistic gains. The child needs a model image to follow and learn the right behaviour. In the family surroundings such models are lost.

From this discussion it can be said that there is deterioration of values in the educational institutions particularly in the schools. There is also deterioration of values in the family and largely in the society leading to a value crisis in the society. Hence, it is the demand of the present time to inculcate values among the students to revive it in the society. It can be possible through value education in the schools. One of the challenges of the modern teacher is how to make value education effective and interesting to the modern youth by integrating values in teaching subjects. Present day curriculum is full of content related to techno informative data consisting of facts, figures, theories and laws etc. Let us see the status of value education in the present day schools.

### **1.8.0 STATUS OF VALUE EDUCATION AND ROLE OF SCHOOL**

NCERT Framework on Value Education (2012) states that the current model of school education turns children into machines as the young generation hardly know how they should live their lives, commit themselves to the welfare of the country, care about the environment and other social and moral issues. Schools are the microcosms of the world. The disorder of the world surfaces to schools in many ways. Peers exert powerful influence on values development. Drug abuse, irresponsible sexual behaviour, vandalism, commercialization, stealing, cheating, confusion between heroes and celebrities as role model, are witnessed more often than ever before. Children and youth need to be educated to practice the commonly held values of harmony and peace with self and others. Children are envoys of the future.

Value education had significant milestones in school education during the post-independence era but in the pre-independence period value education has not found place either in curriculum or other school related programmes. However, different committees and commissions recognized the need to revive interest and attitude towards Indian cultural heritage, national unity, national cohesiveness and basic human values. The present day revolutionalization of institutional action in the subject of value education comes as a welcome strategy to foot the bill in our society infested with ambiguities of motives, goallessness, religious fanaticism, obscurantism and innumerable antisocial motives (Mohan, 2007). Education is an important instrument for inculcation and acquisition of the human values. Education is preparing the future citizens of tomorrow and schools have to vital role to play. Value based teaching was one of the prime focus in ancient period and mostly found till the medieval period but the present scenario of school teaching-learning process is very discouraging due to value less education. Schools can provide integrated curriculum and approaches in value education with subject specific relevance of values curriculum (Dash, 1996). The role of schools for value education should not be confined to presentation and transmission but schools have to play major role in development of values through the different educational strategies which involve reflective and focussing exercises and provide experiential opportunities.

### **1.9.0 OBJECTIVES OF VALUE EDUCATION**

There are certain objectives which can be noted down in the case of Value Education.

Mishra (1987) lists the following objectives for value education:

1. Full development of child's personality in its physical, mental, emotional and spiritual aspects.
2. Inculcation of good manners and responsible and co-operative citizenship.
3. Developing respect for the dignity of the individual and the society.
4. Inculcation of a spirit of patriotism and national integration.
5. Developing a democratic way of thinking and living.

6. Developing tolerance towards and understanding of different religious faiths.
7. Developing a sense of human brotherhood at the social, national and international levels.
8. Helping children to have faith in some supernatural power and order that is supposed to control this universe and human life.
9. Enabling children to make moral decisions on the basis of sound moral principles.

According to Dhanlakshmi (2003) objectives of value education are:

1. To develop social, moral, aesthetic and spiritual sides of a person, which are often undermined in formal education.
2. Value education teaches us to preserve whatever is good and worthwhile in what we have inherited from our culture.
3. It helps to accept and respect the attitude and behaviour of those who differ from us.
4. Value education does not mean value imposition or indoctrination.
5. To transform diseased mind into very young, fresh, innocent, healthy natural and attentive mind. The transformed mind is capable of higher sensitivity and a heightened level of perception.

#### **1.10.0 SALIENT FEATURES OF VALUE EDUCATION**

According to Rajput (1995) the salient features of value education were as follow.

1. Value education and education about religions should not form a separate subject of study for examination at any stage.
2. These would be so judiciously integrated with all subjects of study in the scholastic areas that the objectives there of would be directly and indirectly achieved in the classroom, at the school assembly places, playgrounds, cultural centers and other places.

3. Every teacher has to be a teacher of values.
4. Every activity, unit, textbooks and classroom interaction should be examined from the point of view of value identification/inculcation and reinforcement and appropriate strategy needs to be evolved.
5. Value education needs to be integrated to all activities of the school, classroom teaching, games, cultural activities, welfare services, help to needy students, remediation and nurturing of talent etc. (Same as point 4)

As per NCF (2005), Peace education must be a concern that permeates the entire school curriculum, co curriculum, class room environment, school management, teacher pupil relationship, teaching learning processes, and the entire range of school activities. Education in the true sense should empower individuals to clarify their values; to enable them to take conscious and deliberate decisions, taking into consideration the consequences of their actions; to choose the way of peace rather than violence; to enable them to makers of peace rather than only consumers of peace.

The Education Commission (1964-66), the NPE (1986) and the Ramamurthy Commission Report (1990) recommended that imparting of value education should be an integral part of the entire educational process. Though these recommendations have been made years ago there has been no remarkable progress in the society in the name of Value education. Now, there is a strong urge to follow these recommendations for a better society with aspiring students who can be a real achiever not only in terms of materialistic life but also in terms of humanistic values. We have focused on the concept of value, value education, its meaning and nature, recommendations of different commissions and committees, need of value education, present scenario of value deterioration, status of value education in Indian schools and objectives of value education. It is equally important to know the meaning, nature, objectives and need of science education as the study is dealt with the value inculcation through the teaching of science.

### **1.11.0 MEANING OF SCIENCE AND TECHNOLOGY**

Recently the text book of science in standard IX was changed as the text book of science and technology. Hence the subject ‘Science’ and ‘Science and technology’ is used interchangeably in the present study.

Since the very dawn of civilization man was curious to know about the things around him. The curiosity of man to know about nature and unveil its mysteries led to the establishment of certain knowledge based upon facts. He also tried to understand its laws and utilize them to his daily life. Science is perhaps our most important approach to understanding. It is of special importance that today’s children become aware of how we strive for understanding and the nature of conceptual structure that have been built through science. Science is one of those human activities that man has created to gratify certain human needs and desires in which disinterested curiosity has been the greatest motive power of scientific research.

Science cannot be defined uniquely, there are, perhaps, as many definitions of sciences there are scientists. Henri Poincare explains the idea that way, “Science is built of facts as a house is built of stones; but accumulation of facts is no more a science than a heap of stones.” In the words of Conant (1951), “In the first approximation we say that science emerges from the other progressive activities of men to the extent that new concepts in turn lead to further experiments and observations.” In the same spirit, Lederman (1983) observes that science is a dynamic, ongoing activity, rather than a static accumulation of information. Science can also be defined as the process by which we increase and refine understanding of ourselves and of the universe through continuous observation, experimentation, application and verification.

### **1.12.0 NATURE OF SCIENCE AND TECHNOLOGY**

According to Sharma (2009), Science word is originated from latin verb ‘Scere’ means ‘to know’ and latin noun ‘Scientia’ means ‘knowledge’. The Academic Press Dictionary defines science as the systematic observation of natural events and conditions in order to discover facts about them and also to formulate laws and principles based on these facts. Hence science is the concerted human endeavor to understand, or to understand better, the history of the natural world and how the

natural world works, with observable physical evidence as the basis of that understanding. It is done through observing natural phenomena, and through experience that tries to stimulate natural processes under control conditions.

Science is product as well as process. In other words, science is body of knowledge that has been accumulated by scientists, and the process in which they acquire this knowledge. The body of scientific knowledge can be classified into facts, concepts and generalizations, theories and laws. Sharma (2009) list the following thirteen process of science which came from the inquiry by the American Association for the Advancement of Science (AAAS).

- i. Observation
- ii. Classification
- iii. Number relations
- iv. Measurement
- v. Space/time relations
- vi. Communication
- vii. Prediction
- viii. Inference
- ix. Making operational definition
- x. Formulating hypothesis
- xi. Interpreting data
- xii. Identify and controlling variables
- xiii. Experimenting

Human beings are curious by nature. They have highly developed mental ability which helps them to observe precisely, correlate observations and predict future happenings on the basis of these observations. This ability has helped human beings to adjust to nature. They explore, interpret and change the physical world according to their own need and requirement. The process of observing, describing, exploring and using the physical world is nothing but science.

Science is a dynamic, expanding body of knowledge covering ever new domains of experience. How is this knowledge generated? What is the so-called scientific method? As with many complex things in life, the scientific method is perhaps more

easily discerned than defined. But broadly speaking, it involves several interconnected steps: observation, looking for regularities and patterns, making hypotheses, devising qualitative or mathematical models, deducing their consequences; verification or falsification of theories through observations and controlled experiments, and thus arriving at the principles, theories and laws governing the physical world. There is no strict order in these various steps. Sometimes, a theory may suggest a new experiment; at other times an experiment may suggest a new theoretical model. Speculation and conjecture also have a place in science, but ultimately, a scientific theory, to be acceptable, must be verified by relevant observations and/or experiments. The laws of science are never viewed as fixed eternal truths. Even the most established and universal laws of science are always regarded as provisional, subject to modification in the light of new observations, experiments and analysis.

Science has the potential to be beneficial or harmful, emancipative or oppressive. History, particularly of the twentieth century, is full of examples of this dual role of science. How do we ensure that science plays an emancipative role in the world? The key to this lies in a consensual approach to issues threatening human survival today. This is possible only through information, transparency and a tolerance for multiple viewpoints. In a progressive forward-looking society, science can play a truly liberating role, helping people out of the vicious circle of poverty, ignorance and superstition. In a democratic political framework, the possible aberrations and misuse of science can be checked by the people themselves. Science, tempered with wisdom, is the surest and the only way to human welfare. This conviction provides the basic rationale for science education.

Science has occupied almost all spheres of human life. We are living in a society which is completely drawn into the scientific environment. Now we cannot think of world without it. The wonderful achievements of science has glorified the modern world and transformed the modern civilization into a scientific civilization. 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 process of acquiring it (Fitzpatrick, 1960).

Thus, Science is dynamic, expanding body of knowledge covering every new domains of experiences, which helps in preparing pupil to think and sharpen their intellect making them more careful and systematic in reasoning, as well as providing a unique training in truth, inculcating a spirit of inquiry, developing the capacity to know the unknown and giving strength to face failure, thereby forming the reliable and powerful knowledge system in the progressive forward society. There is, of course, one thing about which we feel no doubt or hesitation: Education, Science based and in coherence with Indian Culture and Values can alone provide the foundation as also the instrument for the nations' progress, security and welfare (Education Commission 1964-1966).

### **1.13.0 OBJECTIVES OF TEACHING SCIENCE AND TECHNOLOGY**

According to NCERT (2006) on the basis of NCF (2000) the objectives of teaching science and technology are:

- Expose the children to basic processes of science.
- Understand the processes that underline simple scientific and technological activities.
- Develop and understanding of simple scientific and technological activities.
- Make children understanding application of basic scientific principles to solve problems related to daily life.
- Develop the ability apply appropriate concepts of science.
- Develop measurement and manipulative skills and to encourage use of locally available resources.
- Familiarize the children with life processes, health, nutrition and human disease.
- Acquaint the children with the technology that abounds in their immediate surroundings.
- Create awareness of the immediate environment and a need for its protection.
- Make children recognize the relationship of science, technology and society.

#### **1.14.0 NEED OF SCIENCE AND TECHNOLOGY EDUCATION IN SCHOOL CURRICULUM**

Education commission (1964-66) clearly stated the need for science education as follow, “We lay great emphasis on making science as an important element in the school curriculum. Science should be taught on a compulsory basis to all pupils as a part of general education during the first ten years of schooling. In addition to that there should be provision of special courses on these subjects at the secondary stage for student of more than average ability. This programmes become meaningful & useful only if the science curricula are recognized & brought up-to-date. The method of teaching vitalized and proper facilities provided for teaching of subject.

The aims of science differ from primary level to secondary & secondary to higher secondary. At higher secondary stage diversification of studies will take place, science will not be studied on a compulsory basis by all the students. Those who opt for specialization may take physics, chemistry, biology, mathematics. So from higher secondary stages the in-depth studies of different science subject are start. Before it all the science subjects are inculcated in science.

#### **1.15.0 SCIENCE AND TECHNOLOGY EDUCATION IN INDIA**

Indian civilization is one of the oldest civilizations in the world, and India is well known in the west and the rest of the world mainly of her ‘spiritual inclination’ but from time immemorial and even during modern period people outside as well as even within the Indian subcontinent do not know much about her contribution in the field of mathematics, medicine, astronomy, agriculture, navigation, architecture etc. For example modern medical sciences almost throughout the world now for recognize the importance of yogic practices which are the contributions from ancient Indian literature. In this regard Sharma (1981) notes that, the oldest Indian scripture ‘Rig-veda’ refers to physicians and speaks of healing power of medicinal herbs. The concept of atom and the formation of the world as discussed in the ‘Vaisehika’. One of the upnishads’ approaches the modern western thought. The ‘Sankhya philosophy’ by Kapila is very much like Darwinism. The ‘Upa-vedas’ or secondary Vedas discusses various sciences. One of these upvedas is ‘Ayurveda’ which consists of six books on surgery, anatomy, therapeutics, toxicology and supplementary section deling

with various local diseases. Great attention was given to diet. In surgery they attained great proficiency. The medicines of the Hindus embraced a vast collection of drugs belonging to the mineral, vegetable and animal kingdom, many of which have been by western physicians. Gurukul system of education was the first mode of dissemination of knowledge prevalent in ancient India. The teaching of the science subjects (along with other subjects) was centered around individuals (Gurus) who passed on their knowledge and skills to their disciples. Later universities such as Taxshila and Nalanda were established, and these universities were of international repute at that time. During this period, due to the gradual conquest of the country by foreign invaders from west Asia and central Asia. Our renowned seats of learning were destroyed.

The modern science of the West was brought to India by the conquest of British and started flourishing slowly and steadily. British Authorities like Charles Grant, Lord Macaulay Wood etc. were responsible for introducing science as one of the subjects in schools in British India. During post-independent period science and mathematics were made compulsory at middle and secondary school level: later it was also suggested diversification of courses having science group subjects as optional channel at higher secondary level. For the first time after independence in India, all India seminar on teaching of science was held at Tara Devi in 1956, to discuss all the problems connected with teaching of science up to higher secondary level: the problem of science text books was also discussed in this seminar. Setting up of Indian parliamentary and scientific committee in 1961 further strengthened the science education programme especially at school level. This committee, also discussed allied problems such as growing importance of sciences in the affairs of mankind, changes in the processes and goals of science etc. (Rao, 1993).

The Education Commission (1964-66) came out with several recommendations to improve the system of education in India. In its report, a lot of emphasis was laid on science education too; it had drawn the attention of all concerned regarding the bad shape of science education programme at that time and had recommended the upgrading of the school curricula and the revision of the text books and teaching learning materials.

As part of the implementation of the recommendations, NCERT, New Delhi was charged with the duties of producing standard nationalized text books for various school subjects including science.

NPE (1986) was discussed and adopted by the Indian parliament status through the section 8.19 “Science educational programme will be designed to enable the learner to acquire problem solving and decision making skills and to discover the relationship of science with health, agriculture, industry and other aspects of daily life. Every effort will be made to extend science education to the vast majority of people who have remained outside the pale of formal education.” NPE (1986) was further supported by programme of action for the actual time scale strategies for the implementation of the policy.

#### **1.16.0 SCIENCE AND TECHNOLOGY AT SECONDARY LEVEL**

According to C.C. Gillispie, “Science connotes both the knowledge contained in such disciplines as astronomy, physics, chemistry, biology, and geology and the activities involved in obtaining it.” It is generally agreed that although science first arose from the attempts of ancient Greek philosophers, especially Aristotle, to understand the world in rational naturalistic terms rather than in theological terms, its full development has been largely a product of the past four centuries.

Science at the secondary level has got its nomenclature as Science and Technology since 2005. It includes general science and technology for all (including the syllabus affiliated to Gujarat Secondary and Higher Secondary Board). The science and technology syllabus at this level include the portion of different areas including Biology, Chemistry, Physics, Agriculture, Dairy Industry etc.

Psychologically, secondary school years are very crucial years for the child’s development. It is the duration when the ability to think, to resolve problems, to differentiate and evaluate and other more prominent characteristics develops. At this duration if adequate exposure is provided to children then they can develop more.

At the secondary level, science should be introduced as separate discipline, with emphasis on experiments/ technology and problem solving. The current two streams, academic and vocational, being pursued as per NPE (1986), may require a fresh look in

the present scenario. Students may be given the option of choosing the subjects of their interest freely, though it may not be feasible to offer all the different subjects in every school. The curriculum load should be rationalized to avoid the steep gradient between secondary and senior secondary syllabi. At this stage, the core topics of a discipline, taking into account recent advances in the field, should be identified carefully and treated with appropriate rigor and depth. The tendency to cover a large number of topics of the discipline superficially should be avoided (NCF-2005). The NCF emphasizes the importance of multiplicity and fluidity of options at the senior secondary level, discouraging the entrenched tendency to place children in fixed streams, and limiting opportunities of children, especially from the rural areas.

Science is itself true, honest, accurate and right. The values like, cleanliness, good health, neatness, honesty, truthfulness, goodness, righteousness, dignity of work, equality etc. can directly be taught while teaching science. There are certain values, which are interdisciplinary to science like, co-operation, dignity of labour, equity, friendship, respect to others, tolerance, etc. can also be taught through the integrated approach of teaching science.

#### **1.17.0 PRESENT SCENARIO OF SCIENCE AND TECHNOLOGY TEACHING IN INDIA**

The science teachers should possess more skills than just content mastery. A science teacher should have good observation skills, experimental skills, scientific attitude, and communication skills and should give the students a better learning experience, also the students must be given freedom to satisfy their natural curiosity and for exploring their environment. But unfortunately the teaching-learning of science is found to be limited into four walls and dominated by chalk and talk method. Students depend mainly on rote learning rather than acquiring scientific literacy. NCERT (2006) also opines that teaching-learning of science in India is mainly dominated by traditional lecture method which serves least in nurturing the curiosity and creativity in students. Also though activity based teaching has been accepted as a paradigm for science education, it has been hardly translated into actual classroom practice.

### 1.18.0 VALUES AND SCIENCE AND TECHNOLOGY

Science is related with values. Knowledge of science without values has no meaning and quite harmful. Having values with a person with the knowledge of science can think about himself, others and society. Values can help a person not to use his/her knowledge of science for a wrong means. According to Swami Ranganathanandaji (1996) "...If we depend upon the genes, i.e. the body, we will only be selfish, self-centered and no dharma or value-system can come out of us, nor can we understand dharma or science of values from that position. But, once we detach ourselves a little from this genetic system, we expand our sense of self-hood, we achieve *Atma Vikasa* (spiritual growth) as Vedanta puts it, and we enter into the science of values, into our journey on the long spiritual road of happy and fruitful and peaceful inter human relationship. The sooner humanity understands this truth, the sooner will it be able to direct evolution in the right direction".

Science is often equated with facts, knowledge and experiments. The subject matter of science enables one to develop critical thinking skills, decision making and problem solving skills. While teaching Science, developing scientific attitude is the main aim but a variety of human values can also be developed. While speaking about the qualities of a good spring balance, qualities like sensitivity, stability and consistency can be pointed out. Further it promotes curiosity to learn more and develop scientific attitudes and emphasize how human kind needs to stop exploiting nature to his advantage.

Life Sciences promote values of reverence for nature and the creator. Teaching of Science also promotes values through activities of Eco Clubs, Nature Clubs, Adventure Clubs, Health and Wellness Clubs etc. For instance in the Science textbooks there is a topic on, Refraction of Light, and students observe an illusion that a straight glass rod appears bent when placed in a glass tumbler. The understanding of processes of refraction and bending of lights conveys that sometimes what we are seeing with our own eyes may not be true, just as the glass rod half dipped in water in a glass tumbler appears to be bent but it is only an illusion. As we learn more about properties of light, we know why rod appears bent. Use examples of this kind to illustrate the phenomenon of cultural biases toward others. Similarly the topic of parasitic plants which thrive on each other can be used to explicate how nature

supports interdependence. There is mutual support and sharing contributing to collaboration and survival even in plants. Human beings who are at the highest level of evolution must realize this value of survival based on interdependence and collaboration. Observation, comparison and analysis are all skills developed during teaching of Science. These skills can be translated into 'Values' that can help students to connect with each other and the community.

Hence value and science are interrelated. They can be considered as two sides of the same coin and there is a need to make them inseparable. This can be possible with the help of integrated approach. Here the researcher is made an attempt to integrate value with science using integrated approach. Let us discuss details about values and approaches of imparting values.

#### **1.19.0 NEED OF VALUE EDUCATION IN TEACHING OF SCIENCE AND TECHNOLOGY**

Various subjects are taught in the school for the holistic development of children. It is assumed that personal, social, national, aesthetic, and eternal values are to be imparted through the teaching of these different subjects. This is one of the objectives of our hidden curriculum. But it should be noted here that values cannot be taught like a subject, i.e., like Languages, History, Science or Mathematics. They can only be inculcated through the situations deliberately planned while teaching various school subjects. It is therefore imperative that Values Education be woven into the teaching of subjects. All Languages contribute to the development of skills like listening, speaking, reading and articulation of ideas.

The very nature of Social Science (Geography, History, Political Science and Economics) is to understand the human and social environment for developing a humane and values based perspective. Mathematics and the Sciences need to be oriented towards their role and responsibility in fostering values rather than being seen in isolation. Similarly, Sports and Fine Arts (performing and visual) also offer the opportunities to initiate and develop values among students. There are some values that are present in every lesson. They may be articulated directly or indirectly in the form of stories, processes or biographical references. The task of the teacher is to identify the apparent or hidden references to values and use them as reference

points to initiate a discussion on values within the subject specific domain (CBSE, 2012).

In the same way one of the purpose of teaching science is to impart certain personal, social, aesthetic and moral values underlying in the subject content. It is the duty of the teacher to highlight and impart these values among students while teaching science using different approaches and techniques.

### **1.20.0 METHODS OF TEACHING VALUES**

Value education has been constantly been taking place in the schools whether the teacher deliberately does it or not. Education is a process of bringing about desirable changes in the behavior of an individual in his/her knowledge, skills, attitudes and values. The school seeks to achieve this through its curriculum which is nothing but the sum total of all its organized activities. Curriculum thus essentially has a value basis. Teachers and schools, therefore, are engaged in value education although without explicitly considering its goals and methods.

In value education literature, three methods of imparting value education viz. direct, indirect and incidental are usually mentioned.

The direct method of value education refers to deliberate, systematic attempt by the teacher to teach values as a subject or an area of thought. The special purpose of the direct method is the immediate accomplishment of definite ends or goals. This method aims at acquainting the pupils, consciously and overtly with the skills, techniques and qualities required to get the right answers to moral questions and giving them practice involving moral problems. Such a method might include regular classroom instruction, talks and discussion to develop knowledge and understanding of values, discussion of situations involving value conflicts, presenting students with value dilemmas and developing the ability to make sound value judgments.

In the Indirect method, value education is given indirectly as a by-product of teaching a particular subject. It is assumed that all educational effort is aimed at value development. Thus, instruction in any subject has value development also as one of its aims.

In incidental method, many incidents which can be labeled as right or wrong do ordinarily occur in every school. Their frequency may be high or low depending upon several factors. The advocates of this method see in such incidents opportunities for value education and want them to be exploited for the purpose. Whenever an incident which has a value implication is noticed by a teacher, he/she has an opportunity to use it for giving the right value precept.

Teaching of values can be done through many ways through direct clarifications on values, through teaching values as a separate subject, through value based role plays, through project work on specific values to the students, through social interaction, discovery of values by students, discussion on Values and through integrated approach by teaching with different subjects.

### **1.21.0 THE INTEGRATED APPROACH**

Integration in no ways contradicts or alters the existing pattern rather it means supplementing or strengthening the existing pattern with what is pivotal in view of changing needs, situations etc. It is a process with which values can be spontaneously incorporated into the various subjects of the curriculum. The values are inherent in the school subjects, for example, Science aims to develop values like neatness, cleanliness, the systematic approach, the rational approach etc.; Social Studies aim at developing socialism, secularism, nationalism, equality, social justice etc.; Languages aim to develop love, friendship, fellow feelings, aesthetic values etc.; Social Useful Productive Work (SUPW) aims to develop values like hard work, dignity of labour, learning by doing etc.; Sports, dance and play aim to develop discipline, national integration, international understanding etc. In an integrated approach, the role of teacher is to understand the values inherent in the subjects and try to highlight those values while teaching their concern subjects. Due to much emphasis on the value inculcation during teaching, some teachers also try to do that while teaching their regular subjects. It should be more emphasised and should be a part of their curriculum transaction.

We have, for instance, ‘Integration of ICT in different subjects’. In the same manner realizing the call of the time and to sharpen our future generations we can integrate values with the normal course of teaching-learning process. On the basis of these

values and its proper inculcation in student here the researcher made an attempt to inculcate specific values through the teaching of Science. As science is a discipline which leads to logical, mental and scientific development, the child can easily understand the concepts of science through value based situations.

### **1.22.0 STEPS FOR VALUE INCULCATION USING INTEGRATED APPROACH**

The following steps can be used in value inculcation by using integrated approach:

- i. Identification of the value forms the content.
- ii. Planning the lessons keeping in mind the objectives of the content and inculcating values.
- iii. Teaching the content and highlighting the values.
- iv. Summarization of the content along with the values.

The values are inherent in the school subjects, for example, science aims to develop values like neatness, cleanliness, the systematic approach, social justice etc.; languages aim to develop love, friendship, fellow feelings, aesthetic values etc.; sports, dance and play aim to develop sportsmanship, aesthetic values, respecting others decision etc.

The above discussion has thrown some light on the value and science education and integrated approach. Also by the recommendations of committees on value education and its need, the secondary school students are highly related to inculcate values as secondary school students are energized and they can attain some goal in a short span of time. So the values inculcated among them will be imbibed among them which in turn will make them as responsible citizens. It is difficult to observe on the out of school activities of the students so if we want to inculcate values in the students then integration of value education in teaching is most suitable as teachers can provide value education within the subject teaching. Looking into the processes and objectives of teaching science, certain values can be inculcated with its teaching.

### 1.23.0 RATIONALE

Education in general and value education in particular occupies a prestigious place in the modern context of the contemporary society. The problem of value education of the young students has assumed increasing prominence in educational discussions during recent times. Parents, teachers and society at large concerned about values and value education of children. Education is expected to play a major role in promoting national development of all the faculties towards adequate preparation for life. We are witnessing tremendous value crisis throughout the world today. The reappearance of barbaric qualities of selfishness, clashes, conflagration and other destructive forces give clear indication of degeneration process of human society.

According to ICNR Medical Journal Report during the last decade, suicide rate in India increased from 6.4% to 10.5%. There is rapidly increase in crime rates also. So, there is an urgent need for a great effort to receive and reform the values of human life and to rejuvenate the foundation of civilization. Value crisis of the present day life is baffling the minds of educators and the students as well. The democratic ideology that has been accepted by our country is yet to be actualized in the form of social and economics democracy as to realize democratic values guaranteed by the constitution of India. The deterioration of value in education in present day is rapidly increasing. The present Indian educational system is reflecting more or less borrowed ideologies and philosophies while the national values are relegated to the background. The teacher educators and teachers are not being clearly oriented to the national values, personal values, social values, environmental values, ideals and ideologies that they have to inculcate in students. Hence they are not in a position to play their roles as value educators. Our curriculum does not reflect human values and value system. Hence our school and colleges have become examination centers and not value centers. In educational reconstruction, the problem of an integrated perspective on values is pivotal, for its solution alone can provide organic unity for all the multifarious activities of a school or college curriculum and programmes. An integrated education can provide for integrated growth of personality and integrated education is not possible without integration of values.

From last few years, our country have observed fall in the basic value which is required for any society to form a strong and healthy society and nation. Value

Education is essential for all round development of personality. The NPE (1986) recommended, “Conscious and organized attempts be made for imparting education in social, moral and spiritual values.” Hence there is need of serious efforts to integrate values through education system. NCF (2005) also talked about having Peace Education in India’s perspective. “Teachers should make deliberate attempts to infuse and reinforce the importance of peace related values that are commensurate with the textual material taught in schools and the developmental stage of children.” Peace education can be feasible if the children have essential values like, brotherhoodness, secularism, cooperation, equality, equity, tolerance, respect for other etc. which can be incorporated among children through integrated approach while teaching different subjects. Science being an important and interesting subject for students, there is much more scope for inculcating values while teaching the subject using integrated approach. Adding values with illustrations and examples can also help to make science teaching more interesting.

Education whether it be formal or informal is a very good medium through which there can be proper inculcation of values among children. Many issues in the society occurs due to the decline of values from the society which is not good for prevailing the harmony of the society. All these issues happen due to the deterioration of values in humans. Education system is often blamed for not imparting proper values among children. Hence there is a need for imparting values among students using best practices and integrated approach has the potential to impart values among students in a smooth manner.

Value education is imparted through various ways but when it is related with classroom teaching methods, we see that it enables the teacher to inculcate values through content of the textbook. Here the major role played by the content of textbook to inculcate values among students. The present study focuses on exploring the value oriented content, finding values from the content, focusing on the values and inculcating those values among the students through teaching science. The study was conducted on the secondary school students as they are mature and future citizens who will play great role in construction of society. Jurseyed (n.d.) has rightly pointed that adolescent is a period of great stress, strain and strive. In face every revolution changes take place in the personality of child at this stage. This is a stage when

mental, physical, social and sexual changes take place. By providing value education through different situation, stability can be maintained in the life of adolescent. It is very necessary to provide value education through indirect way of content so that the future of the students can be molded in a better way. Adolescent is a very crucial stage, so it is necessary to provide or to impart the value education at this stage which is imbibed in the contents of different subjects.

On the basis of researches reviewed and the present scenario of Value education in the society, though there are many practice undertaken to inculcate values in education, no one found using integrated approach in inculcating values. Hence, the researcher had undertaken a study where the proper inculcation of few values was done through the process of teaching science. Researcher has opted science as a subject to be taught using integrated approach as it plays important role in the process of transmitting knowledge, culture and values. Science is a subject which is well known for developing better cognitive aspect of human through its problem solving techniques and logic related concepts, these concepts can be very useful for proper inculcation of values and it was done using integrated approach where students were taught values along with the teaching of the content of science.

Secondary education is one of the very important stage of education which precedes elementary education and proceeds higher education. Children of Adolescent age use to be there at secondary education. Value conflict and turmoil is one of the specific characteristic of these children. Hence there is a need to manage these children at this stage through inculcating values through integrated approach. Standard IX being the beginning step in secondary education and students being tender to receive value education, standard IX is considered in the present study. Ten values like, Equality, Co-operation, Simplicity, Dignity of Labour, Determination, Honesty, Common goal, Discipline, Loyalty to duty and Team work were considered in the present study as there is more scope for relating these values while teaching standard IX science and technology.

#### **1.24.0 RESEARCH QUESTIONS**

The following research questions were in the mind of the researcher that lead the researcher to undertake the present study.

- Whether values can be inculcated through integrated approach while teaching science and technology?
- Whether integrated approach of teaching science will affect the achievement of students in science and technology?

#### **1.25.0 STATEMENT OF THE PROBLEM**

TEACHING OF SCIENCE AND TECHNOLOGY THROUGH INTEGRATED APPROACH FOR VALUE INCULCATION AT SECONDARY LEVEL

#### **1.26.0 OBJECTIVES OF THE STUDY**

1. To develop an intervention programme for teaching of science and technology through integrated approach for the inculcation of values like Equality, Co-operation, Simplicity, Dignity of Labour, Determination, Honesty, Common goal, Discipline, Loyalty to duty and Team work in regular classroom teaching.
2. To implement the developed intervention programme for teaching of science and technology through integrated approach for the inculcation of the values like Equality, Co-operation, Simplicity, Dignity of Labour, Determination, Honesty, Common goal, Discipline, Loyalty to duty and Team work.
3. To study the effectiveness of the intervention programme on integrated approach for value inculcation in teaching science and technology in terms of conceptual knowledge of values and value perception along with the achievement in science.
4. To study the reaction of students towards the intervention programme on integrated approach for value inculcation in teaching science and technology.

#### **1.27.0 HYPOTHESES**

Basically the present study is an experimental study. Though the present study is an attempt to find out the answers of the broad research questions, the following null hypotheses were formulated to find out the specific cause and effect relationships between variables. By testing these hypothesis the researcher would be able to find out the effectiveness of the developed intervention programme for teaching science

through integrated approach to inculcate values. These hypothesis were tested at 0.05 level of significance.

**H<sub>01</sub>:** There will be no significant differences between the mean post-test value conceptual knowledge score of standard IX students studying through the value integrated approach and those studying through traditional approach in the value of Cooperation.

**H<sub>02</sub>:** There will be no significant differences between the mean post-test value conceptual knowledge score of standard IX students studying through the value integrated approach and those studying through traditional approach in the value of Dignity of Labour.

**H<sub>03</sub>:** There will be no significant differences between the mean post-test value conceptual knowledge score of standard IX students studying through the value integrated approach and those studying through traditional approach in the value of Equality.

**H<sub>04</sub>:** There will be no significant differences between the mean post-test value conceptual knowledge score of standard IX students studying through the value integrated approach and those studying through traditional approach in the value of Team Work.

**H<sub>05</sub>:** There will be no significant differences between the mean post-test value conceptual knowledge score of standard IX students studying through the value integrated approach and those studying through traditional approach in the value of Discipline.

**H<sub>06</sub>:** There will be no significant differences between the mean post-test value conceptual knowledge score of standard IX students studying through the value integrated approach and those studying through traditional approach in the value of Determination.

**H<sub>07</sub>:** There will be no significant differences between the mean post-test value conceptual knowledge score of standard IX students studying through the value

integrated approach and those studying through traditional approach in the value of Simplicity.

**H<sub>0</sub>8:** There will be no significant differences between the mean post-test value conceptual knowledge score of standard IX students studying through the value integrated approach and those studying through traditional approach in the value of Honesty.

**H<sub>0</sub>9:** There will be no significant differences between the mean post-test value conceptual knowledge score of standard IX students studying through the value integrated approach and those studying through traditional approach in the value of Common Goal.

**H<sub>0</sub>10:** There will be no significant differences between the mean post-test value conceptual knowledge score of standard IX students studying through the value integrated approach and those studying through traditional approach in the value of Loyalty of Duty.

**H<sub>0</sub>11:** There will be no significant differences between the mean post-test value conceptual knowledge score of standard IX students studying through the value integrated approach and those studying through traditional approach in the values as a whole.

**H<sub>0</sub>12:** There will be no significant differences between the mean post-test value perception score of standard IX students studying through the value integrated approach and those studying through traditional approach in the value of Cooperation.

**H<sub>0</sub>13:** There will be no significant differences between the mean post-test value perception score of standard IX students studying through the value integrated approach and those studying through traditional approach in the value of Dignity of Labour.

**H<sub>0</sub>14:** There will be no significant differences between the mean post-test value perception score of standard IX students studying through the value integrated approach and those studying through traditional approach in the value of Equality.

**H<sub>0</sub>15:** There will be no significant differences between the mean post-test value perception score of standard IX students studying through the value integrated approach and those studying through traditional approach in the value of Team Work.

**H<sub>0</sub>16:** There will be no significant differences between the mean post-test value perception score of standard IX students studying through the value integrated approach and those studying through traditional approach in the value of Discipline.

**H<sub>0</sub>17:** There will be no significant differences between the mean post-test value perception score of standard IX students studying through the value integrated approach and those studying through traditional approach in the value of Determination.

**H<sub>0</sub>18:** There will be no significant differences between the mean post-test value perception score of standard IX students studying through the value integrated approach and those studying through traditional approach in the value of Simplicity.

**H<sub>0</sub>19:** There will be no significant differences between the mean post-test value perception score of standard IX students studying through the value integrated approach and those studying through traditional approach in the value of Honesty.

**H<sub>0</sub>20:** There will be no significant differences between the mean post-test value perception score of standard IX students studying through the value integrated approach and those studying through traditional approach in the value of Common Goal.

**H<sub>0</sub>21:** There will be no significant differences between the mean post-test value perception score of standard IX students studying through the value integrated approach and those studying through traditional approach in the value of Loyalty of Duty.

**H<sub>0</sub>22:** There will be no significant differences between the mean post-test value perception score of standard IX students studying through the value integrated approach and those studying through traditional approach in the values as a whole.

**H<sub>0</sub>23:** There will be no significant differences between the mean post-test Science and Technology achievement score of standard IX students studying through the value integrated approach and those studying through traditional approach.

### 1.28.0 OPERATIONAL DEFINITIONS

- **Value Perception:** Value perception in a specific value is the score secured by a person in the value perception scale prepared by the researchers.
- **Value Conceptual Knowledge:** Value conceptual knowledge of a specific value is the score secured by a person in the value knowledge test prepared by the researchers.
- **Achievement in science and technology:** The achievement in science and technology in the present study is considered as the total marks secured in the achievement test prepared by the investigator.

### 1.29.0 EXPLANATION/DEFINITION OF THE TERMS USED

- **Integrated Approach in Science and Technology:** Approach of teaching science and technology for the purpose of achieving the objectives of teaching science and technology along with imparting values during the same process integrating both the concepts of science as well as values.

**Equality:** Equality means treating all the person equally without any discrimination on the basis of caste, colour, creed, race sex language, nation or religion

**Co-operation:** It is a quality to adjust with people, place and time while working in group, accepting group decision and promoting healthy competition to achieve the group goal.

**Simplicity:** It is the quality related to simple and natural living without artificial and ornamental behaviour to influence and free from ego.

**Dignity of Labour:** It is the quality of doing any work accepted by the society giving proper respect to it and respecting the jobs of others.

**Determination:** It is an act of setting target and working hard to achieve it. It is a firm resolve or intention to do an act seriously and see its end.

**Honesty:** It is a quality not given to lies, cheating, false or misleading and free from fraud. It is the quality to work or earn in a just and fair manner.

**Common goal:** This is the quality to accept and respect the goals set by the society for the universal betterment and long term development.

**Discipline:** It is a systematic and rigorous training of the mental, moral and physical powers for making one self control, obedient and good for the society.

**Loyalty to Duty:** It is the quality or state or an instant of being loyal and honest to ones' work and responsibility.

**Team work:** It is the quality of working with others respecting fellow workers, considering own responsibility, following the leader and norms of the group for the betterment of the team mates and the society.

### 1.30.0 DELIMITATIONS OF THE STUDY

- The present study was delimited to the standard IX English medium students of secondary level following GSHSEB curriculum.
- Values in the present study were limited to ten values viz. Equality, Cooperation, Simplicity, Dignity of Labour, Determination, Honesty, Common goal, Discipline, Loyalty to duty, and Team work.

### 1.31.0 ORGANISATION OF CHAPTERS

The present study is reported in five chapters. The detailed organization of the chapters is given as follows.

**Chapter I:** This chapter deals with the Conceptual Framework including, meaning of definitions of value, nature and classifications of value, various commissions and

committees on value education, present scenario of value deterioration, need of value education, status of value education, objectives of value education, salient features of value education, need of value education in teaching science, meaning and definitions of science, nature of science, objectives of teaching science, need of science in school curriculum, science education in India, recommendations of different commissions and committees on science education, science & technology at secondary level, present scenario of science teaching, values and science, methods of teaching value, the integrated approach, steps for value inculcation using integrated approach, rationale, research questions, statement of the problem, objectives, hypothesis, operational definition of the terms, explanation of the terms used, delimitation of the study and the scheme of the chapters.

**Chapter II:** This chapter provides the overview of the review of related research work done in the area of value education and science education.

**Chapter III:** This chapter deals with the methodological procedures used in the present study. This chapter includes the major points like, design of the study, population, sample, development of the intervention programme on value education and its implementation, tools for data collection, procedure of data collection and data analysis techniques used in the present study.

**Chapter IV:** This chapter deals with the analysis and interpretation of data related to the development of values in different dimensions, testing of hypothesis, reaction of students towards the developed intervention programme and major findings of the study.

**Chapter V:** This chapter deals with the summary and conclusion including introduction, rationale, research questions, objectives, hypotheses, methodology, major findings, implication of this study, suggestions for further research and conclusion.

This chapter is followed by bibliography and appendices.