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Theories are at the highest level of abstraction because we investigate the relationship between propositions. Theories are networks of propositions

– Ram Ahuja
2.0 Introduction

This chapter deals with a brief theoretical overview on values, perception, information and communication technology (ICT). It is an attempt to re-explore the related-relevant theories, researches and materials in the problem area under present study. Actually the theoretical overview was prepared from the different angles of values, perception and ICT in separate manner.

2.1 Concept and Meaning of Value/s: Etymological, Philosophical, Psychological, Sociological, Economical and Educational Meaning

There are different opinions on the concept, meaning and dimensions of the term ‘Value’ among religious Gurus, spiritualists, philosophers, sociologists, social reformers, psychologists, politicians, economists, educationists, humanists and intellectuals. In this context, Maslow (1982) said that, “Values are defined in many ways and mean different things to different people. As a matter of fact, it is so confusing semantically that I am convinced we will soon give up this catch-all word in favour of more precise and more operational definition.” Although their (religious Gurus to intellectuals) opinions differ widely but all of them stress the role and significance of values at personal, national and international levels.

Values are precipitate of human behaviours and they are established predispositions of behaviour as well. Values may refer to interest, preferences, likes, pleasure, duties, moral obligation, desires, needs, aversion, attraction and other modalities of selective orientation. Values, in other words, are found in the large and diverse Universe of selective behaviour. Social science considers value to be conception of the desirable influencing selective behaviour. According to Kluckhonn (1951), “Values regulate impulse satisfaction in accord with whole array of
hierarchical enduring goals of the personality, the requirement of both personality and
socio–cultural system for order, the need for respecting the interest of others and of
the group as a whole in social living.” Thus the values as criteria are most significant
in social scientific analysis.

Generally, values refer to those guiding principles of our life which are
conducive to one’s physical and mental health as well as to social welfare and
judgement and which are in tune with one’s social culture. Values are what is
attractive to a person, they operate as criteria for making judgements between
alternative cause of action and they directly influence the quality of the individual’s
behaviour and decision as a rule, the individual adopts those values which help him to
achieve the ends he desires and which are at same time sanctioned by the group with
which he is identified, his values are thus influenced by and are reflections of his / her
overall personality. It reflects one’s personal attitude, judgements, decisions, choices,
social behaviour, dreams and vision. They influenced and give proper directions to
our thoughts, actions and quality of life. Seshadri (1992) stated that “Values refers to
objects that human beings consider desirable and worthy of pursuit in their thoughts,
feelings and actions. These objects may be material or abstract qualities and states of
mind and heart like truthfulness, happiness, peace, justice. In any case, they function
as ideals and standards and govern human actions.” Thus the values contain some
cognitive elements that they have directional quality and it also involve some
affective component. The values served as criteria for selection in action. When most
explicit and fully conceptualized, values become criteria for judgement, preference
and choice. When implicit and ineffective values nevertheless perform as if they
constitute grounds for decision and behaviour. According to Hurlock (1964), “Values
are concepts heavily weighted with emotions. They are the concepts of the desirable
which influence the selection from available modes, means and ends of actions.”

People differ in their value system. Every person develops values which seem important to him and guided his or her life. Values are subjective as they are entirely dependent upon the changing opinion of the valuing agent and thus deny to them all objective validity. Every person has likes and dislikes and they project them upon outside objects which in themselves are valueless. So there is no standard of value, other than individual taste. Therefore, the values change from one individual to another according to their own capabilities and priority.

The concept and definition of the term value is very relative and fully contextual in this world. There is no suitable definition which gives us the absolute definition for this term. Value has to be experienced by a person in his life with his own actions. It is fact that any types of information, examples or pictorial representations should not give the personal experiences about the values. But it is observed that the values are deeply embedded in human thoughts and actions. Therefore, it is very much important to realize the meaning of the term ‘value’ through different views.

Thus the essence of etymological, philosophical, psychological, sociological, economical and educational meaning of values is discussed here in this respect.

a) **Etymological Meaning and Origin of the concept of ‘Value and Values’:**

The word ‘value’ is derived from a Latin root ‘Valerie’. Meaning of it is ‘to be strong aid vigorous’. To be of ‘value’ is to have a certain virtue. It is also derived from the French word ‘valere’. Both these two words give the meaning ‘worth’. Worthy is always valuable. In Greek, ‘ethics’ is the word used to indicate the term ‘value’. We know that the ‘ethics’ is the western ‘Neethi-Shastra’. In Sanskrit literature and in
almost all Indian languages we find two words like ‘Mulyam’ and ‘Moolyam’ which are synonymous with the term ‘value’.

According to Aggarwal (2005), German philosopher Friedrich Nietzsche (1844 – 1900) is said to have used the word ‘Values’ first in the year 1880. Beforehand, the word ‘Value’ was used as a singular noun, meaning the measure of something, for example, value of money, value of land etc. It was also used as verb, meaning to value as esteem something. Friedrich Nietzsche used the word ‘Values’ in plural to denote moral attitudes and beliefs that were personal and subjective. Several thinkers also believed that ‘Values’ were not necessarily conducive for making strong personalities. However, in the present democratic societies, the concept of ‘Values’ has undergone radical changes.

b) Philosophical Meaning:

According to N. L. Gupta (1986), “In philosophical contexts values are those standards or a code for conduct conditioned by one’s cultural tenets and guided by conscience, according to which human being is supposed to conduct himself and shape his life patterns by integrating his beliefs, ideas and attitudes to realise cherished ideals and aims of life.” Actually values are part and parcel of philosophy. It is already established that philosophy is the origin of values. Philosophy has three branches, known as epistemology, metaphysics (Ontology) and axiology or theory of value. Epistemology deals with the nature, origin, validity and extent of knowledge. Metaphysics deals with the nature of reality, life, soul, God etc. Axiology deals with the logic, ethics and theology or religion. According to axiology, called the theory of value and study of goodness, considerable expansion has been given to the meaning of the term ‘Value’ which covers eight ‘realms’ – morality, religion, art, science, economics, politics, law and custom. The main classification of significance, which a
system of values is consistently confronted in the development of an individual and a society in all aspects, is three-fold: Intrinsic, Instrumental and Technical. It is fact that there is wide difference in eastern and western philosophy and as such the occidental and oriental values also differ. The tenets of philosophy form the various bases of values. Ecology of a place or age also plays an important role in formulating the theory of values.

There are various definitions for the term ‘Value’ in the theories of philosophy. These definitions may be expressed through three broad categories, viz. subjective, objective and relational definitions of values. Some definitions of values under the aforesaid three categories are given below.

i) Subjective definition of values: Dictionary of Education (1959) stated that “Things in which people are interested-things they want and desire to be or become or feel as obligatory, worship, enjoy”. Comprehensive Dictionary of Education (2008) more specifically defines the values as “The general principles governing conduct within a given sphere in a society, generally accepted by the group as a standard by which conduct can be judged.”

Subjective definitions of values are stated in terms of sentiments and emotions. Here, value experiences are not always under the control of reason but they depend upon a relationship between an observer and that which is being evaluated.

ii) Objective definition of values: Joan (1942) said that “Values seem to reside in the objects just as truly as do colour, smell, temperature, size and shape.” Lewis (1950) further said that “Our judgements of values of good and evil, right and wrong, better and worse are kinds of genuine empirical knowledge that is comparable to empirical knowledge in other fields.”
Objective definitions of values emphasize that the values belong wholly to the inner world of a person. Values are always independent and they reside in the object, not in the subject. Plato, Aristotle, Neothomism, Medieval Realisms, Modern Realisms and Idealisms agree that the values are in same as senses and therefore objective.

**iii) Relational definition of values:** This type of definition is a joint reflection or contract of both the subjective as well as objective views of values. This category relates the concept of values as the relation between a valuing human and their social environment, i.e. from the both standpoint of values. Sanyal (1962) rightly said that “Value is, therefore, partly feeling and partly reason. The feeling part is hedonistic or material in character; it is not efficient or dynamic. The reason part is regulative both formally and finally, varying in degrees of formality and finality. A value is, therefore, the meeting ground of the regulative principle and part of the constitutive principle.” It is a comprehensive view of values and therefore the values have their own relational properties or qualities.

c) **Psychological Meaning:**
Psychologically, by virtue of which a thing becomes so desired for an individual, is called a value. Most desirable is most valuable. Knowledge about the fact is the root for desire. Fact is something which can be seen, heard or known by some means directly or indirectly. As an example, a student is very ambitious to become a doctor in future life. If he or she becomes a doctor through rights means, then ambition of becoming a doctor is considered as a value. It is fact that the values reflect one’s personal attitudes and judgments, behaviour and relationships, decisions and choices, dreams and visions. It influences our thoughts, feelings, motivations and actions. Thus
the human psychology is an important base of values. There are various definitions from psychological viewpoint, such as given here.

**Allport (1937)** informed, “Value means the relative prominence of the subject’s interest or the dominant interest in the personality”.

**Woodruff (1952)** stated, “Value is conceptualized in terms of personal happiness, security and existence of the behaving organism.”

**Margenau (1959)** said, “A value is the measure of ‘satisfaction of human wants’.” Actually he indicates two kinds of values – factual and normative.

**Hall and Lindzey (1964)** stated that, “The amount psychic energy invested in an element of the personality is called value of that element; value is a measure of intensity. When we speak of placing a high value upon a particular idea or feeling, we mean that the idea or feeling exerts a considerable force instigating and directing behaviour.”

**Jones and Gerard (1967)** said that ‘in our usage value refers to a wide range of motivational phenomena. Any singular state or object for which the individual strives or approaches, extols, embraces, voluntarily consumes, incurs, expense to acquire is a positive value. Anything that individual avoids, escapes from deplores, rejects or attracts is a negative value. Values animated the persons; they move him around his environment because they define its attractive and repelling sectors.’

**d) Sociological Meaning:**

**Encyclopedia of Britannica (1959)** noted that, “Values are subsumable under the heads of Goodness, Beauty and Truth – a three-fold cord, not slightly broken.” Values
are those social principles which a particular society thinks observable in regard to the overall welfare of both individuals and society at large with reciprocity and interaction. These are determined in terms of truth, beauty and goodness for every individual and community life. Thus, sociologically value has no meaning for an isolated person (who is completely separated from all kinds of social environments). But no person lives separately from society. In the societal context that which one is useful to others is called value. It may be a thought, speech, contract or deed of a person or a group. Value binds two or many people in the society. When many persons live together, talk together, move together, work together etc., then there is need of code of conduct, social rules, regulations and laws. These social rules, regulations and laws put several restrictions on every person of the society. By following them, an individual becomes a valuable person in the society. One who is well adjusted has got more values and the other is vice versa. The eminent sociologist **Prof. R. K. Mukherjee (1956)**, who defines ‘value’ as “Values are socially approved desires and goals that are internalised through the process of conditioning, learning or socialisation and aspirations.”

**Verma (1972)** stated that, “Sociologists have chosen the value objects from the field of social traditions, practices and modes of actions, which are important in the life of an individual vis-a-vis his social environment.” **Usha Rao (2011)** rightly said that, “The sociologists are concerned with the questions like value – diversity, value – clashes, value – tensions, value – conflicts, social change, socialisation, innovations, modernisation and preferred futures. The legitimacy of the sociologists’ involvement is based on the task of examining the social relations and processes as valuation phenomena.” There are some aspects like gender discrimination, caste distinction, racisms are essential parts of values. But earlier values are not one and the
same always. The concept was that whatever society demands is a value and it is the same always everywhere. But new concept is that value changes. Value changes when class, caste, religion, gender changes. If the right to equality is properly implemented, there will be fewer clashes between values. But for this we need proper political, cultural, economical and social ambience.

e) **Economical Meaning:**

Another important area of social science, economics, which had traditionally thought of values only in terms of exchange value of commodities. It is fact that value is an abstract term which is commonly regarded as an economic conception. John Dewey (1948) said, “Value means primarily, to price, to esteem, to appraise, to estimate. It means the act of cherishing something holding it clear and also, the act of passing judgement upon the nature and amount of its value as compared with something else.”

‘Artha’ is a value in the field of Economics. Everyone works to earn money. Because the money has purchasing or consuming value and therefore it is also called as an instrumental value. Status of a person or a country depends upon the wealth or money. All the economic activities are based on the money and wealth.

Koutilya (350 BCE – 275 BCE) rightly said, ‘Arthamoolo hi sarvam.’ Academic’s Dictionary of Commerce (2008) gives suitable definition of value, as “The price which an item would fetch in an open market. Distinction should be made between value in present use and value in alternative use. Value is also determined by various other factors ranging from sentiment to long – term speculation”.

Now Economics is also taking interest in human values. Dr. Amartya Sen (1987) also talked about human centred development in his book on ‘On Ethics and Economics’.
f) Educational Meaning:

Education is not confined to the imparting of important information only, it has to give the learners a proper sense of values. Brubacher (1939) stated, “To state one’s aim of education is at once to state his educational value.” Therefore the content of education should be defined as a set of values. Only education can develop a sense of comparison between good and evil, right and wrong, positive and negative. In the field of education values are to be caught and not to be taught. There is no doubt about this statement when an ideal society is developed in this world. The situations have already changed at present. Now it is very difficult for us to find the role model in our educational society. Hence it is the present need of the hour to incorporate value education at every levels of education. Value education is education in values and education towards the inculcation of values.

Education is value itself. It develops behaviour and shapes the personality of individuals. It prepares the persons as cultured citizens of the nation. Education must help the persons to adjust to the new environment. It increases the mental strength of the persons and makes them to face the new challenges in the world. Thus the education is considered as value education. Education as a value is an instrument to develop the whole society. Proper value education has to up bring a person from animal level to human level. Harmonious blend of brain, heart and hand makes education as value education. UNESCO (1996) rightly said, “Education must help to engender a new humanism, one that contains an essential ethical component and sets considerable store by knowledge of, and respect for, the cultures and spiritual values of different civilizations, as a much-needed counterweight to a globalization that would otherwise be seen only in economic or technological terms. The sense of
shared values and a common destiny is in fact the basis on which any scheme for international co-operation must be founded.”

Value oriented education is a tool which not only makes the ability to get job for learning, but also creates a sense of purpose and importance of life. In the present context we have to move through value added educational process. There is no alternative. But the curriculum of different subjects of formal education finds little scope for cultivation of values in the psycho – social field of human mind. Thus the values can be inculcated in human minds in informal and non – formal ways of education. Now, human resource development (H.R.D.) does not mean only skill development or knowledge development, it means development on the foundation of the human values. Knowledge, skill, attitude, aptitude, intelligence (IQ, EQ and SQ), behaviour everything depends on development of values. We have to take value education to the cognitive domain of learning from affective domain of learning. Tuning of the values in education with the first changing global society is very important at present scenario. National Curriculum Framework (2005) gives importance to the components of value education like social equality, secularism, gender equality, scientific temper, national unity, peace education, work culture etc. Swami Vivekananda (1893) has realized that, “The education which does not help the common mass of people to equip themselves for the struggle for life, which does not bring strength of character, a spirit of philanthropy, and the courage of a lion – is it worth the name? Real education is that which enables one to stand on one’s own legs. He further said, “Education for values should be education for man – making and character building.” Swamiji has laid stress on the values of cultivation of heart, faith, fearlessness, personal and social purity, self sacrifice and service to others
through proper education. Thus the education is the manifestation of values which gives us ultimate goal of the life.

2.1.1 Theories of Values

There are different theories on values, which emerged from various outlooks such as, Idealist, Pragmatic, Empiricist and Realist. The basis of categorises of these theories is epistemological. Let us briefly analyse the theories of values.

**Idealist Theory:** Idealist theory discusses the state that it ‘ought to be’. Some argues that what it considered as ‘oughts’ may or may not present in the reality while others are of the view that they are in presence. An idealist believes in the ‘absolute’, thus there is a component of Universality attached to values. Transcendental source of values are also highlighted in the idealist theory.

**Pragmatic Theory:** Pragmatic means practical and this theory assumes that values are determined by their practical applicability, importance, or outcome. Pragmatist walks with the *Darwinian theory* of evolution, believes in the survival of the fittest and values are seen in the context of survival. As example, John Dewey argues that a bird’s nest and a king’s palace are same in their aesthetic value as both support life. There is no basic artistic difference between a bird’s nest & a king’s palace and they both are equally beautiful. Nothing is valuable in itself but depends on its practical utility. Thus the pragmatic theory of value is that life is all about survival and all values are for life.

**Empiricist Theory:** In the pragmatic theory of value, an individual is in the centre of creation of values i.e. an active agent. A king makes a palace, a palace of value, and thus the king is the creator of value. But in the empiricist theory, the individual is not
an active agent in creation of values but is a passive agent. This theory says that values are self-existent and they are maintained by a kind of mental & emotional condition which determines the attitude of the person. Values are imaginative constructs made around ideals which can’t be empirically verified. They are formed and nurtured due to repetition of same situations according to laws of associations. The values are ideals necessary for our life.

**Realist Theory:** Ruhela (2000) stated, “According to realism, the objects of our experience are independent of the experience and since values are also objects of experience, they do exist independent of us.” The values exist independently of human responses to them. In the realist theory of value, a person is directed by values which are self-existent. Ruhela (2000) explains the basic assumptions of the pragmatic theory. He said that the pragmatic theory is essentially personalistic. While defying universality and objectivity to values, the pragmatism reduces their meaning and significance to the level of the individual. Thus it recognises relativism in the sphere of all values. There might be similarity between the notions of values of different individuals but, since the background and experience of each individual is different, the notion of values of each person will also be different enough.

2.1.2 Nature and Characteristics of Values

There are certain assumptions regarding the nature of human values. In formulating a conception of values, Rokeach (1973) gives five assumptions on the nature of human values, which are given below:

I. The total number of values that a person possesses is relatively small;
II. Values are organized into value systems;
III. The antecedents of human values can be traced to human culture, society and its institutions and personality;

IV. All men everywhere possess the same values in different degrees;

V. The consequences of human values will be manifested in virtually all phenomena that social scientists may consider worth investigating;

These five assumptions also represent a set of reasons for arguing that the value concept more than any other should occupy a central position across all the social sciences. Any conception of human values must be able to account for the enduring character of the values as well as their dynamic characteristics.

Now we can identify the main characteristics of human values on the basis of above assumptions:

a. The values are the standards or guidelines for an individual’s life and also for a nation.

b. The values are influenced by an individual’s emotions, experiences, desires and actions.

c. The values possess cognitive, affective and co-native aspects.

d. Values can be measured on qualitative and quantitative basis.

e. The values are modes of developing code of conduct for individuals.

f. The values can be structured and restructured through the process of reflective thinking.

g. The values are acquired consciously and sub – consciously in many ways.

h. The values are organized into value systems of every individual. The total number of values that constitute every individual’s value system is not very large.

i. All values are not important for all persons.
j. The values are very helpful for our survival and our life’s journey.

k. The values are not static, rather dynamic.

l. The values get derived from several sources.

m. Anything which has utility for an individual or a society is called value.

n. The values appear sometimes partly and sometimes wholly.

o. Values differ according to races, religions, cultures, societies and nations.

2.1.3 Components of Values

Values have cognitive, affective and behavioural components.

I. A value is a cognition about the desirable equivalent to what Morris (1956) called ‘conceived value’ i.e. an individual has a value is to say that cognitively he has known the correct way to behave.

II. A value is affective in the sense has he can feel emotional about it, be affectively for or against it, approve to those who exhibit positive instances and not approve of those who exhibit negative instance as it.

III. A value has behavioural component in the sense that it is intervening variable that leads to action when activated.

2.1.4 Sources of Values

There are three important sources of the values. They are –

a) Culture as a source of the values.

b) Religion – spiritual source of the values.

c) The Constitution as a source of the values.

The word ‘culture’ is used in different senses and it has various dimensions. Now it is not possible to discuss them in this context. But a few essences of culture are given here. The University Education Commission (1948 – 49) expressed,
“Culture is an attitude of mind, an inclination of the spirit and those who yearn for it, wish to have a vision of greatness, sit in the presence of nobility, see the highest reach and scope of the spirit of man.” The Commission further said, “Our art and literature, our law and history belong to the mainstream of our culture. Every Indian student should get to know the main outlines of the history of India, which is not a mere chronicle of date and defeats, of follies and failures. He should know the lives of the heroes who express the spirits of our civilisation ...”. Thus the cultural heritage implies the values prevalent in India since the ancient times. It is also noted that the changing culture on effect of scientific and technological advancement influences the values.

Religion and spirituality are inter-related and also inter-dependent to some extent. Both of them have some common components. True religion is the motive power behind all ethical and moral code of conduct. It is fact that the ethical and moral values come from the religion and spirituality. According to Ross, “It is through religion that the youth can be set on the road to the pursuits of the absolute values: truth, goodness and beauty.”

The values are enshrined in the Constitution of a country. The Indian Constitution is great sources of the values for the Indian people. The most important parts of the Indian Constitution are, The Preamble of the Constitution, Part III dealing with Fundamental Rights and Part IV containing Directive Principles of State Policy. The Preamble ensures every Indian citizen: Justice, Liberty, Equality, Fraternity, Secularism, Integrity, Socialism, and Democracy.

In other hand, family, educational institution, club, media, political party are also important source of value formation and development. Person acquires several values from his/her parents, other family members, communities, teachers, friends,
social and political leaders, spiritual personalities, newspapers, radio, television, films, books, internet etc. Thus the sources of the values are many.

2.1.5 Value versus Virtue

Meaning of the two terms, value and virtue are misinterpreted in many places. These two terms are used synonymously and seems to be overlapped. But there is clear distinction between them. Ethics deal with the values and moral deals with the virtues. Value is a broad aspect or term and virtue is a narrow aspect or term. Value includes virtue but not vice versa. As for example, truth is value and speaking truth is virtue. B. Mukhopadhyay (2005) noted as, “Values do not mean only virtues. Moral values are known as virtues. Ethics deal with right and norms. Ethics is a system or code of morals.”

2.1.6 Indicators of Values

In physical science, different scales of temperatures are used to measure temperatures. These scales are used to measure the same physical quantity ‘temperature’ and they are called ‘temperature indicators’. These different scales of temperatures are used for various purposes. For example, the Fahrenheit scale is used for clinical and metrological works; the Centigrade scale is used in all scientific works; the Reamer scale is used for domestic purposes. An individual can use any type of temperature scale, at anytime, anywhere. But any such type of scale is unavailable to measure the values.

The virtues are used to identify the values which are potential in individuals. Different types of virtues are very helpful in recognition of values in individuals. Virtue is a quality to be practiced in our daily life. Our behaviour and disposition tell about virtue. Our quality based on the sum total of these virtues is called as character.
Therefore character is value and conduct is virtue. Thus the virtues are called value indicators. Therefore the observable behaviours throw light on values.

Different types of human actions are indicators of values. Every action of human must be tested in the background of predominant values. Personification of a value is an indicator of the prominent value possessed by a great person. For example, ‘Non Violence’ is the prominent value in ‘M. K. Gandhi’.

There are more other value indicators, such as truthfulness, keeping promise in high, free from corruption, and having qualities like sincerity, honesty, curiosity, quest for knowledge, spirit of inquiry, sense of democracy, sense of secularism, sense of brotherhoodness, humanism etc.

2.1.7 Nature of Value System

According to William (1968), “If and when a person’s behaviour is guided over a considerable period of times by one and only one value . . . more often particular acts or sequences of acts are slurred by multiple and changing cluster of value.” Rokeach (1973) enlarges the areas of human value system as cognitive representation and transformation of needs as, “A value system is an enduring organisation of beliefs concerning preferable modes of conduct or end – state of existence along a continuum of relative importance.” Basu (1996) furthermore comments that, “After a value is learned it becomes integrated somehow into an organised system of value wherein each value is ordered in priority and at the same time to the total value system as relatively stable over time. It is stable enough to reflect the fact of same – ness and continuity of a unique personality socialized within
a given culture and society. Yet unstable enough to permit a rearrangement of value priority as a result of changes in culture, society and personal experience.”

**Anmol’s Dictionary of Education (2003)** indicates a narrow definition of value system i.e., “These are the briefs on good and bad aspects of behaviour held by a culture or social class.” But variety in personal, societal and cultural experience will not only guarantee individual differences in value system but also individual differences in their stability. The both kinds of individual differences can be expected as an effect of differences in intellectual development, degree of internalization of culture and institutional value identification with sex role, political identification and religious upbringing. But education is more capable of developing strong and abiding values. An interdependent, accepted or consistent set of values is mentioned as value system. The bedrock of the edifice of education is the value system which is undoubtedly conducive to the development of physical, intellectual, moral and spiritual life of a human being.

**2.1.8 Classification of Values**

The concept of value is not confined to education, philosophy and psychology, but it is also nurtured in sociology, religion, economics, and many other fields. A great deal of research has been, and continues to be done by social psychologists, eminent thinkers and researchers of values. Various attempts have been made in those cited field-literatures to classify values. A few of them are as follows:

**Turner (1929)** classified values into two main sections (a) Abstract Values, and (b) Concrete values.
Allport and Vernon (1931) classified values into six categories on the basis of Spranger's six types of men. They classified values as Theoretical, Economic, Social, Political, Aesthetic and Religious.

Ginnies et al. (1948) divided the values into two. First (1st) Essential values: goals and satisfactions that man and society accept for themselves in an on-going and expanding process of life and mind and second (2nd) is an Operational value: those which they regard as means to serve and promote the former.


Kluckhohn et al. (1951) showed a tentative analysis of values in terms of dimensions. They considered eight dimensions: (1) modality, (2) content, (3) intent, (4) generality, (5) intensity, (6) explicitness, (7) extent and (8) organizations. They had elaborately analysed different values in each of the dimensions.

Spindler (1953) divided values into two main groups: (A) traditional values which include (1) Puritan Morality: stands for responsibility, thrift, self denial and sexual constraint; (2) Work success ethics: implies that successful people worked hard to become so; (3) Individualism: it means that individual is sacred and always more important than the group; (4) Achievement orientation: It means that success is a constant goal which should be future time oriented. (B) Emergent Values which include (1) Sociability - one should like people and get along well with them; (2) Relativistic Moral Attitude - what the group thinks right is the morality. This value ignores the ‘Ought’, (3) Considerations for others; (4) Hedonistic present time
orientation – one should enjoy the present within the limits of well rounded balanced personality and (5) Conformity to group – stresses the fact that individual should confirm to the group norms.

Rosenberg (1957) introduced a list of occupational values: (1) Making a lot of money, (2) Chance to be creative, (3) Helpful to others, (4) Avoid high pressure, (5) World of ideas, (6) Freedom from supervision, (7) Slow and sure progress, (8) Leadership, and (9) Work with people and not with things. Although each ‘way’ appears to be a complex of several values, yet some of them can be easily identified as values.

Pepper (1958) classified the values as affective value and cognitive value. Affective value is associated with pleasure and the avoidance of displeasure. Cognitive value i.e. having to do with the attainment of desired states. Such an analysis must be aware of prudential value, character value (mainly personality integration), social value, cultural value, biological and survival value.


Kluckhohn and Strodtebeck (1961) identified four basic problems crucially common to all human groups: (1) Human nature – orientation dealing with character of innate human nature; (2) Time-orientation dealing with the temporal focus of human life; (3) Activity-orientation dealing with the modality of human activity; (4) Relational-orientation dealing with the modality of man’s relationship to other men.

**Broudy (1964)** considered all the educational values into nine categories. They are: Economic, Health, Bodily, Recreational, Social, Moral, Aesthetics, Intellectual and Religious values.

**Roth (1964)** states the values as “something, which vary with different cultural groups and even with different individuals. However, there are certain traits that need developing in all children. They are: (1) capacities to satisfy one’s need, (2) awareness of standard, (3) positive and negative feelings, (4) capacities to discover, (5) desirable behaviour patterns, (6) moral and spiritual characteristics, (7) skills to meet needs and (8) development of critical thinking.”

According to **Fuster (1964)**, values are certain standards or general principle on which person determines behaviour and judges its approval or disapproval. His classification puts the ethics in terms of values. He considers three types of values i.e., (1) Social, (2) Moral and (3) Religious.

**Buhler (1964)** classified the values into six types: (1) The value of love, (2) Authoritarian conscience, (3) Conformism, (4) Development of individual’s potential, (5) Honesty and (6) Respect of knowledge and acquisition of more knowledge.

Rescher (1969) has observed the six main principles for classifying values. They are: (1) Subscribership, (2) Object items, (3) The sort of benefits at issue, (4) The sort of purposes at issue, (5) The relationship between subscriber and beneficiary and (6) The relationship of the value to other values. These six factors indicate distinct, “dimensions” with respect to which values can be characterized.

Goulet (1971) stated two classes of values: (1) Operative values which deal with objects representation worthy of acting upon and (2) Significative values confer meaning and significance to existence. Values are also classified as (1) Tool values (which are means to achieve other values) and (2) Terminal values (Values good in themselves).

Weil and Weil (1971) divided values into three main categories: (1) People oriented values which include items such as case, concern, cooperation and helpfulness with people rather than things; (2) Extrinsic reward values which deal with money, status and security and (3) Expressive values which include items as teaching that provide an opportunity to use special abilities and aptitudes.


Singh (1972) adds two more dimensions in ‘value classification’, as (1) Platonic versus Physiological value and (2) Routine versus Non-Routine value.
Dixit (1972) classified the values in seven categories: (1) Physical, (2) Recreational, (3) Economic, (4) Social, (5) Democratic, (6) Intellectual and (7) Family.

Berelson and Salter (1972) divided values in two categories: 1) Values of Heart: It includes adventure, affection, idealism, independence, justice and patriotism; 2) Values of Mind: It includes domination, economic success, personal success, power, problem solving competence and social security.

Three types of value have been classified by Rokeach (1968): (i) descriptive or existential belief, those capable of being true or false; (ii) evaluative, wherein the object of belief is judged to be good or bad and (iii) prospective belief where in some means or end of action is judged to be desirable or undesirable. Value that concerns desirable mode of conduct or desirable end state of existence can be of two types – instrumental and terminal.

Rokeach (1973) stated that value is either instrumental or terminal in nature. Instrumental values are the means value and the terminal values are the end ones. Instrumental values are two types – moral value and competence value. The moral value refers mainly to modes of behaviour and do not necessarily include value that concerns end states of existence. Actually it refers only to certain types of instrumental value that have an interpersonal feeling of guilt. But competence value has a personal rather than impersonal focus and do not seem to be especially concerned with morality. Terminal value may be self-centred or society-centred, intrapersonal or interpersonal in focus. Rokeach had given a list under the two broad categories.

Instrumental values: A person having instrumental may be - 1) Ambitious, 2) Broadminded, 3) Capable, 4) Cheerful, 5) Clean, 6) Courageous, 7) Forgiving, 8)


Hunt (1975) listed the following values in the modern age:


Gokak (1982) has classified and grouped values under the five basic human values. The five values are truth, righteous conduct, peace, love and non-violence.

J. C. Verma (1983) has suggested the following values to be inculcated among school students for their self-development:


Jangira (1985) listed the values into the following two groups:

1) Core values: It is consisting of mutual trust, faith in the goodness of man, social courtesies leading to mutual respect, pursuit of excellence in work, appreciation of aesthetics, supporting the just cause, truthfulness, etc.
2) **Ethical values**: It is consisting of hard work, regularity, punctuality, respect for teachers, concern for the prestige of the institution, avoidance of telling lies for the petty gains, smoking, drinking, gambling, stealing and copying.

**Mathur (1986)** has classified the following values of Indian Culture:

1) Avoiding extremes; 2) Receptivity to learn; 3) Spiritual approach to life; 4) Taking comprehensive view of life; 5) Tolerance.

**M. T. Ramji (1986)** has highlighted that the students should be encouraged to acquire the following values:


**Shalom Schwartz (1994)** has done a comprehensive work on values. She views values as ‘concepts or beliefs that pertain to desirable end states or behaviour, transcend specific situations, guide selection or evaluation of behaviour and events, and are ordered by relative importance’. She has developed a schematic representation of maximum number of universal human values (Table 1). These universal values have been defined in terms of motivational goals. These universal values have been organised under two higher order dimensions of values: **openness to change vs. conservation, and self enhancement vs. self transcendence.** According to **Schwartz (1994)**, “Values are not merely abstract conceptions of what is considered as desirable, but are motivational in nature and influence our choices and actions. These values express certain human needs, and these needs then motivate social behaviour”.


Table 1: Values and Motivational Goals Associated with Them (as per Schwartz, 1994)

<table>
<thead>
<tr>
<th>Sl.No.</th>
<th>Value</th>
<th>Motivational Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Hedonism</td>
<td>Self centred sensual gratification</td>
</tr>
<tr>
<td>2</td>
<td>Power</td>
<td>Status and prestige</td>
</tr>
<tr>
<td>3</td>
<td>Achievement</td>
<td>Competitive personal success</td>
</tr>
<tr>
<td>4</td>
<td>Stimulation</td>
<td>Encourage risk taking and adventure</td>
</tr>
<tr>
<td>5</td>
<td>Self direction</td>
<td>Autonomous thought and action</td>
</tr>
<tr>
<td>6</td>
<td>Universalism</td>
<td>Concern for welfare of others</td>
</tr>
<tr>
<td>7</td>
<td>Benevolence</td>
<td>Preserve and enhance welfare of those with whom one is in personal contact</td>
</tr>
<tr>
<td>8</td>
<td>Conformity</td>
<td>Self-restraint</td>
</tr>
<tr>
<td>9</td>
<td>Tradition</td>
<td>Traditional and religious activities</td>
</tr>
<tr>
<td>10</td>
<td>Security</td>
<td>Stability, safety and harmony of society, relationships and self.</td>
</tr>
</tbody>
</table>

Australia Government Experiments on Value Education in Schools from the year 2004 have identified following 9 values:

1) Care and Compassion; 2) Doing Your Best; 3) Fair Go; 4) Freedom; 5) Honesty and Trustworthiness; 6) Integrity; 7) Respect; 8) Responsibility; 9) Understanding, Tolerance and Inclusion.

2.1.9 Measurement of Values through Psychometric Instruments

Psychometric instruments measuring values have been used in a wide variety of research studies to compare the work-related, moral, child-rearing, and other values of different cultures. Some of them are mentioned here.

Morris (1956) prepared a tool ‘ways to live’ which deals with values - (1) preserve the best that man has attained, (2) Cultivate independence of persons and things, (3) Show sympathetic concerns for others, (4) Experience festivity and solitude in alternation, (5) Act and enjoy life through group participation, (6) Constantly master changing conditions, (7) integrate action, enjoyment and

The Study of Values (Allport, Vernon and Lindzey, 1960), one of the popular values inventories has offered six categories of values based on Spranger’s (1928) ‘Type of Men’. It includes theoretical, economic, aesthetic, social, political and religious aspects of human life.

In India, Dr. K. Raychowdhry (1959) adapted the original ‘Study of Values’ (Allport and Vernon, 1931) in English to be used in Indian conditions. Other value scale also prepared later in English, on the basis of Allport-Vernon as per Spranger’s classification. Ojha and Bhargava constructed ‘Study of Value Test’; Singh and Ahluwalia (1994) prepared ‘Teacher Values Inventory (TVI)’. In India, various types of ‘Value Tests’ had also been prepared in English.

Dennis (1961) in his ‘Uses Test’ used the following six values: (1) Substantative, (2) Benevolent, (3) Malevolent, (4) Hedonistic, (5) Aesthetic and (6) Religious.

Perry (1965) has classified the values according to modalities of interests as positive-negative, progressive-recurrent, potential-actual, and so on. ‘The job value card’ includes the values of (1) Leadership, (2) Interest, (3) Esteem, (4) Power, (5) Security, (6) Self expression, (7) Profit, (8) Fame, (9) Social service and (10) Independence.

Thomas (1967) divided the values in six categories. They are: (1) Aesthetic, (2) Humanitarianism, (3) Intellectual, (4) Power, (5) Material, and (6) Religious. He has developed ‘Differential Value Profile Instrument’ on the basis of the above six values.
Walter and Thomas (1967) developed a value instrument and attempted to measure the following value factors: Happiness, Size, Sociability, Ability, Sharing male acceptance, Fear of Things, Fear of People, Strength, Cleanliness, Health, Attractiveness, Material Independence, and Total Self-concept score.


Solomon, Ali and Kfir et al. (1972) developed a scale for measuring five democratic values: (1) Equality of representation, (2) Equality of participation, (3) Equality of resources distribution, (4) Assertion responsibility, and (5) Compromise.

Gregory (2012) reported that ‘Work Values Inventory (WVI)’ is a simple instrument designed to measure 15 work values in individuals from junior high level through high school (Super, 1968, 1970). WVI is a self-report instrument consisting of 45 items rated on a 5-point scale and there are 3 items for each of the 15 work values. These values are altruism, aesthetic, creativity, intellectual stimulation, achievement, independence, prestige, management, economic returns, security, surroundings, supervisory relations, associates, way of life and variety.

According to Aiken and Marnat (2009), Rokeach (1968) conducted a cross-cultural research on value. He mentioned that there are two kinds of values: those concerned with modes of conduct (instrumental values) and those concerned with end states (terminal values). Rokeach defined several subcategories of both instrumental
values and terminal values and designed an instrument (Rokeach Value Survey, 1973) to measure them. The Rokeach Value Survey consists of a series of 18 instrumental and 15 terminal value terms or phrases for assessing the relative importance of these values to people. List of values under the two broad categories are already mentioned before.

Gregory (2012) stated in his book, that the ‘Value Scale (VS)’ was developed by a consortium of researchers under the direction of Super and Nevill (1986) to assess 21 values relevant to work and life roles. VS consist of 5 items per value, each rated from 1 to 4. It was developed explicitly for use in cross-cultural research. The values measured by the VS are, ability utilization, achievement, advancement, aesthetic, altruism, authority, autonomy, creativity, economic rewards, life style, personal development, physical activity, prestige, risk, social interaction, social relations, variety, working conditions, cultural identity, physical prowess and economic security.

2.1.10 Brief Essence of Different Committees, Commissions, Policies and Organisations on Human Values in Education

At International Level

The Declaration of Human Rights of United Nations (1948) has listed the following values: Liberty, Equality, Property, Well-being, Peace, Tolerance and Reason.

Educational Policies Commissions of America, 1951:

The Commissions suggested following certain values for public schools, which were considered an important component for American democracy:

1) Respect for human personality; 2) Moral responsibility of the individual; 3) Institutions are servants of men; 4) Common consent (peaceful adjustment rather than
violence); 5) Devotion of truth (freedom of expression); 6) Respect for excellence; 7) Moral equality for all; 8) Brotherhood (the golden rule); 8) The pursuit of happiness (happiness considered as the fullest expression of one’s potentialities – not mere “fun”); 9) Spiritual enrichment;

The White House Conference on Education (WHCE, 1955) laid stress on the following values:

i. Appreciation of our democratic heritage.

ii. Ability to think and evaluate consistently and creatively.

iii. Ethical behaviour based on a sense of moral and spiritual values.

iv. Wise use of time, including constructive leisure pursuits.

v. An awareness of our relationships with the world community.

Learning to be: The World of Education: Today and Tomorrow, UNESCO (1972):

The International Commission stated “Education is an enterprise of universal dimensions, huge and far-reaching, implicit in which are aims which have universal applications, and there has to be a search for balance among the various intellectual, ethical, emotional and physical components of personality and in a positive perception of mankind’s historic fate”. The Commission emphasized the cognitive, co-native and affective domains of human personality and further observed: “The physical, intellectual, emotional and ethical integration of the individual into a complete man is a broad definition of the fundamental aim of education”. The UNESCO’s report also suggested promoting the values of World peace, international understanding and unity of mankind.
Declaration of Congress for Human Unity, Philadelphia (1976):

A few value-concepts have been enumerated in the above declaration, which are as follows:

1) Compassionate love; 2) Intrinsic worth of each human beings; 3) Right for all people to develop their creativity; 4) The inter-dependence of all nations; 5) Solidarity; 6) Freedom and justice for all people; 7) Complete disarmament; 8) Decentralization of power; 9) Freedom of expression of thought; 10) The right to work for just rewards; 11) Preservation of natural and cultural environments. 12) The adjustment of economic structures for greater equality and justice for people; 13) Abolition of all forms of slavery, torture and capital punishment.

Goals and Theories of Education in Asia, UNESCO (1980):

The Report of the Regional Workshop considered that the “Moral goals expect education to develop a human being with all humane qualities. These include some universal values, e.g. the inculcation of integrity, honesty, self-discipline, conscientiousness, truthfulness, compassion, courage, dutifulness, love of freedom and justice, belief in hard work, respect of manual work, and a sense of responsibility”. It is also expected that, “by practising the above set of values, educated citizens would foster desirable personality traits, develop creative abilities and enjoy good health”.

World Declaration on Education for All, Jomtien (1990):

The Report of the Framework stated that, “Education can help ensure a safer, healthier, more prosperous and environmentally sound world, while simultaneously contributing to social, economic, and cultural progress, tolerance, and international cooperation”. It is also expected that, “fundamental aim of educational development is
the transmission and enrichment of common cultural and moral values. It is in these values that the individual and society find their identity and worth”.

**Learning: The Treasure Within, 1996 (Delor’s Commission, UNESCO):**

The Delor’s Commission highlighted that the “Education must help to engender a new humanism, one that contains an essential ethical component and sets considerable store by knowledge of, and respect for, the cultures and spiritual values of different civilizations, as a much-needed counterweight to a globalization that would otherwise be seen only in economic or technological terms. The sense of shared values and a common destiny is in fact the basis on which any scheme for international co-operation must be founded”.

**World Education Report 2000, UNESCO:**

The Report suggested that, “The content, ... , varies widely with circumstances, but in the long run it should include:

- The development of qualities to fit man to live in the modern world, such as personal judgement and initiative, freedom from fear and superstition, sympathy and understanding for different points of view;

- Spiritual and moral development; belief in ethical ideals, and the habit of acting upon them with the duty to examine traditional standards of behaviour; and to modify them to suit new conditions”.

**At National Level – Pre Independence period:**

The subject of human values in education has been under discussion in India for over hundred years ago. As far back as 1882, the Education Commission discussed the subject of reforms and strategies. This was followed by the Indian
University Commission in 1902 and Calcutta University Commission in 1917. In the year 1938, M. K. Gandhi set up a committee on ‘Basic National Education’ under the supervision of Dr. Zakir Husain. It stated that the education system prevalent at that time was not responsive to the socio-economic situation, was not designed to promote values of life and creativity and had no concept of the emerging and anticipated social order. The committee demanded replacement of the system by more constructive and humane system, integrated with the needs and ideas of national life. In the year 1944, the Sargent Committee observed that without an ethical basis, any curricula will be barren. In the year 1946, Religious Education Committee of the Central Advisory Board of Education (CABE) recommended that spiritual and moral teachings which are common to all religions must be an integral part of curriculum and State Governments must accept the responsibility of providing facilities for such instruction in educational institutions.

At National Level – Post Independence period:

The various high level Commissions, Committees, Policies and Frameworks, one after the other have given emphasis on value education since Radhakrishnan Commission (1948 - 49). Here an attempt is done to collect extracts from reports of various Commissions, Committees, Policies and Frameworks to provide a brief overview on the perceptions in value education after independence.

The Report of the University Education Commission (1948-49), called Radhakrishnan Commission Report:

The Commission considered the inclusion of religious and moral education in the educational content at higher education stream. The need for religious instruction was found to be useful in building successful Indian citizens. It suggested that reading
great books, silent meditation, etc. are helpful for building values in education. The Commission stated, “We must habituate the students to right emotions, induce in them the formation of good moral, mental and physical habits. How can we build the values into the human mind? Our attempt should be to suggest and persuade, not command or impose. The best method of suggestion is by personal example, daily life and work and books read from day to day.”


The Commission considered that the religious and moral behaviour of a person is mostly shaped by the influence of home, school and community. It suggested inspiring talks in schools on the life of great persons for inculcation of morality. But it opposed the religious instructions to be given in schools. The Commission also sought to discourage all unhealthy trends of disunity, religions, etc. The Commission’s report stated, “No education is worth the name which does not inculcate the qualities necessary for living graciously, harmoniously and efficiently with one’s fellow men. Amongst the qualities which should be cultivated for this purpose are discipline, co-operation, social sensitiveness and tolerance.”

The Report of the Committee on Religious and Moral Instruction (1960), called Sri Prakasa Committee Report:

The Committee defined moral and spiritual values in education as “Anything that helps us to behave properly towards others is of moral value. Anything that takes us out of ourselves, and inspires us to sacrifice for the good of others or for a great cause is of a spiritual value”. The Committee further said that “The content of such education in moral and spiritual value should include a comparative and sympathetic
study of the lives and teachings of great religious leaders and at later stages, their ethical systems and philosophies. The inculcation of good-manners, social service and true patriotism should be continuously stressed at all stages.” A curriculum framework of instruction in moral and spiritual values in education was also suggested by this committee.

The Report of the Committee on Emotional Integration (1961):

The Committee made 213 recommendations, covering all stages of the education. It felt that emotional integration of the Indian people is a challenge that cannot be ignored by anyone in any part of the country. Tolerance, charity and compassion must be practised if they are not to remain catchwords and empty phrases. The Committee considered that the “education will be incomplete if student are not helped to appreciate the spiritual values which the various religions present to the people.”


The Commission gave emphasis to value orientation of the educational system and stressed on the balanced development of human values. It highlighted the noble ideas of truth, peace, freedom, compassion and non-violence and stressed the creative synthesis of science and spirituality. Along with the advancement of modernisation, the inculcation of democratic value, concept of welfare state, socialism and religious value are very important. The Commission observed that, “a serious defect in the school curriculum is the absence of provision for education in social, moral and spiritual values”. Thus the Commission recommended that, “The Central and State Governments shall adopt measures to introduce education in moral, social and
spiritual values in all institutions under their direct control on the lines recommended by the University Education Commission on religious and moral instruction.”

The National Policy on Education (NPE - 1968):

The first National Policy on Education in 1968 was based on the report of Kothari Commission. NPE (1968) considered that the education should be turned into a forceful tool for the cultivation of social and moral values. Thus the ‘National Policy’ recommended that, “A radical reconstruction of education... will involve a transformation of the system to relate it more closely to the life of the people; ... a sustained and intensive effort to raise the quality of education at all stages; ... The educational system must produce young men and women of character and ability, committed to national service and development”.

The Curriculum for the Ten-Year School: A Framework, NCERT, 1975:

This Framework gave emphasis on “The awakening of social consciousness, the development of democratic values and of a feeling for social justice and national integration ...”. It highlighted that “The school curriculum should have a core centering round the objective of character building. ... Linked with this process of character building is the cultivation of such basic qualities as compassion, endurance, courage, decision-making, resourcefulness, respect for others, the team spirit, truthfulness, faithfulness, loyalty to duty and the common good”.

Values according to National Council of Educational Research and Training (NCERT - 1979):

NCERT (1979) has listed eighty three (83) values in their booklet viewed as “Documents of Social, Moral and Spiritual Values in Education”. The objective of this list was that it should be used for the development of schools curricula.
Eighty three (83) values were:


High Level Seminar on Value Oriented Education, NCERT, Shimla, 1981:

The seminar highlighted that “Provision for value-oriented education should be made throughout the country with due regard for flexibility of approach”. Important recommendation of the seminar was adoption of an integral approach to
value orientation. It suggested that the subject should be handled in a comprehensive manner under the broad spectrum of social responsibility and development of human personality rather than being tackled in a piecemeal manner, dealing with areas such as awareness of ecology, environmental protection, community development, productivity, population stabilisation, aesthetic education, national integration, international understanding etc. It also suggested a holistic approach with an emphasis on inculcation of basic, universal human values amongst students so that they are well prepared to overcome the personal, social, economic and other challenges and actively participate in nation building with understanding and commitment.

**Values according to All India Association of Catholic Schools**

This association has classified values in three categories viz. **Personal values, Neighbouring values and Community values.** Personal values should be practiced by all and these are guided by self innovation. Neighbouring values are the outcome of interaction between two or more persons. Community values are due to wider interaction between groups of people. Two sets of values, namely positive value and negative value are also listed under three values.

In the **Circulars of Kendriya Vidyalaya Sangathan (KVS) on ‘Moral Education’**, the following seventeen (17) values have been suggested:

Report of the Working Group to Review Teachers’ Training Programme, 1983:

The report underlines the need for an integral value oriented education, in which teachers would be transmitting not only deeper values of ethical, aesthetic and spiritual culture but also those related to physical culture, hygiene, care for environment, and other important domains, which are basic to the progress of the country. It also highlighted that, “True self-hood is the integrated centre in which varied personalities are harmonised and integrated personality is thus a recognised ideal that the Indian educational thought has held out as one of the supreme spiritual values. In its fullness, the area of integrated personality connotes the perfection of four-fold personality that harmonises wisdom, power, love and skill in works”.

The National Policy on Education (NPE - 1986):

NPE – 1986 (revised) emphasized the need to cultivate moral and social values as a response to ‘growing concern over erosion of essential values’. The policy has referred to following types of values for cultivation. They are “Our Cultural Heritage, the Democratic way of Life, Scientific Equality, Scientific Temper, Secularism, Our Environment, Gender Equality, Social Cohesion, National Unity, Populations, Quality of Life”. NPE (1986) further said that, “In our culturally plural society, education should foster universal and eternal values, oriented towards the unity and integration of our people. Such value education should help eliminate obscurantism, religious fanaticism, violence, superstition and fatalism”.

Report of CABE Committee on National Policy on Education, 1986:

The committee endorsed the provision of NPE – 1986 and its emphasis on the unity and integrity of the country. Value education should not be confined to the curriculum translated in the classroom. It also recommended several other activities
such as establishing strong school-community linkage, and community songs to retain value system in education. In the year 1986, a Conference on ‘Value Education’ organised by the Central Board of Secondary Education (CBSE), Delhi and identified 50 values (not mentioned here) which should form the ‘school climate’.

National Curriculum for Elementary and Secondary Education: A Framework, NCERT, 1988:

This Framework suggested that, “The content of value education will have to be drawn from various sources – national goals, universal perceptions, ethical considerations and character building. In addition to the values that are concerned with the elimination of obscurantism, religious fanaticism, violence, superstition, fatalism, exploitation and injustice, value education should also have a positive content. Inculcation of value like honesty, truthfulness, courage, conviction, straightforwardness, fearlessness, tolerance, love for justice, dependability, compassion, etc. will help in creating a human society and balanced individuals....”


Ramamurti Committee (1990) reported that, “Democracy, secularism, socialism, scientific temper, equality of sexes, honesty, integrity, courage and justice (fairness), respect for all life forms, different cultures and languages (including tribal) etc. constitute the mosaic of values which is vital to the unity and integrity of the country. The content and process of education should be all pervasively informed by these basic values”. Prime message of this Committee was inculcation of values, “indispensable for creation of enlightened and humane society”. The Committee recommended that imparting of value education should be an integral part of the
entire educational process and school climate, as distinct from dissemination of values through special classes, lectures or textbooks. It also suggested inculcation of values through hidden curriculum for the development of the learners’ personality.

**The Programme of Action (POA) Document (1992):**

POA (1992) has clearly interpreted value education as broad cultural education leading to removal of superstition, obscurantism, religion fanaticism and all other narrow loyalties. It has emphasized the importance of positive approach in which the roots of Indian culture have to be highlighted along with development of scientific temper and unity and national integrity having a specific focus.

**Report of Core Group on Value Orientation of Education, Government of India, 1992:**

The Report of Core Group on Value Orientation of Education has been presented in two parts. The first part identifies “The values can be classified as spiritual, religious, moral, ethical, social, personal, political, economic, aesthetic and altruistic, and so on”. These identified values were also regrouped under five core universal human values, viz. Truth, righteous conduct, peace, love and non-violence. The Report further said that “these different types of values together constitute the totality of human values which reflect the major five facets of human personality. The key to the development of human personality is the inculcation of universal human values”.

The second part documents the important and relevant recommendations made by various committees and commissions on the subject, and presents the profile of some of the national level institutions with their responsibility. The Report expected that the “National level institutions like the NCERT, NCTE, NIEPA and
other appropriate key-level institutions, supported by experts in the field, should organise these programmes” (i.e. Value Orientation of Education). It further said that, “Values have to permeate all stages and within each sector and segment of education. And what are these ‘Values’? These have to be related to the achievement of the growth of human personality which is impregnated with ‘human’ and not ‘animal’ values”.

**Curriculum Framework for Quality Teacher Education, NCTE, 1998:**

This Framework stated that “Increasing delinquency, violence, terrorism and fissiparous tendencies and use of inappropriate means to get one’s ends served are threats to national integration and social cohesion. Democracy, violence and terrorism cannot coexist. Education has to develop a peace loving personality and the programme of teacher education has to contribute in this regard”. It further said that, “Value education demands a planned and purposive approach. It is through education and, as of necessity, through teacher education programmes that the task of inculcating values can be substantially accomplished”.

**Report on Value Based Education (1999), called Chavan Committee’s Report:**

Report of the Committee stated that truth, righteous conduct, peace, love and non-violence, which are called ‘Five Universal Values’ and they represent the five domains of human personality viz. intellectual, physical, emotional, psychological and spiritual and they are correlated with the five major objectives of education, namely knowledge, skill, balance, vision and identity. In order to develop these five universal values, the Committee suggests that overall education system including curriculum, teacher educational programme, curricular material, media, and educational technology, and a host of other strategies may be used. This report also
makes a special attention to human rights education for peaceful co-existence, and of ethics in science and technology.

**National Curriculum Framework for School Education (NCFSE - 2000):**

NCFSE (2000) emphasizes the role of school in imparting values, as it cannot be left to home and community. It stated that value-based education will not only equip an individual in his/her personal development but will also build a society of humane, committed and productive citizens. Because, “Value-based education would help the nation fight against all kinds of fanaticism, ill will, violence, fatalism, dishonesty, avarice, corruption, exploitation and drug abuse”. The five universal values have been suggested for building value-based education. It recommends that every teacher is the teacher of values. It represents the consensus position on the judicious integration of values throughout the school curriculum at all stages. This framework puts emphasis on values related to almost all the aspects of life such as personal, social, cultural, moral, environmental, constitutional, spiritual, etc. Furthermore, key qualities like regularity, punctuality, cleanliness, self-control, industriousness, sense of duty, desire to serve, responsibility, enterprise, sensitivity to equality, fraternity, democratic attitude and sense of obligation to environment protection have been highlighted. NCFSE (2000) has also proposed inculcation moral, ethical, humanistic and constitutional values.

**Report of the School Education Committee West Bengal on Value Education (2002):**

The report suggested that –

a) No curriculum true to its purpose can be value-free.
b) In the course being followed in our primary schools the values to be inculcated through curriculum and other activities have been spelt out adequately. At the secondary level objectives of studying different subjects as stated in the syllabi partly serve this purpose.

c) Erosion of values has become a major concern throughout the world and the education system is expected to play its role in reversing this trend more effectively. Hence additional emphasis needs to be laid on this aspect.

da) Several sets of cherished universal human values can be identified towards this aim.

e) Value education should not be a separate subject for teaching or examination. It should be integrated in all the subjects taught and all the activities undertaken in the school.

f) Literature is the most effective means to inculcate values. Therefore every piece—story, essay, poem, drama etc. – must have specific value focuses.

g) The aspects of mental and social well-being are generally neglected. Of course effective value education may partly address this issue.

National Curriculum Framework (NCF - 2005):

NCF (2005) recommended that ‘education of peace’ should be integrated in schools at two levels: (i) at the broader level, within all curricular and co-curricular activities of the school; and (ii) at the classroom level, by weaving peace dimensions into the content of the lessons. It suggested for promoting peace-oriented values in all subjects throughout school years with the help of relevant activities and forming peace education a component of teacher education. According to NCF (2005) guidelines the values worth inculcation are: appreciation for India’s cultural heritage;
equality of sexes; protection of the environment; egalitarianism, democracy and secularism; Constitutional obligations; nurturance of national identity; observance of the small family norms; removal of social barriers; appreciation for India’s freedom movement; inculcation of scientific temper; human rights including rights of the child, especially of girl child; and inculcation of personal and social values such as cleanliness, compassion, truthfulness, integrity, responsibility, justice, respect for law and order, courage and the values cherished for the functioning of democracy. NCF (2005) stated that the entire school activities should be organized in ways that lead to value development.

**National Curriculum Framework for Teacher Education (NCFTE - 2009):**

NCFTE (2009) stated that “True education is a process of developing the human personality in all its dimensions – intellectual, physical, emotional, social, moral and spiritual. Peace provides an integrating principle for the value orientation of education.”

These essences of values are overlapping. Now we can conclude that the values held by a person – the importance, usefulness, or worth attached to specific activities or objects – are related to, but not identical to, interests and attitudes. Compared with interests and attitudes, values are viewed as more central to individual personality and more basic to the expression of the person needs and desires.

**2.1.11 Message on Values Given by Indian Thinkers of Human Civilisation**

**Swami Vivekananda:** Swamiji (1863 - 1902) has laid stress on the values of cultivation of heart, fearlessness, non-injury, personal and social purity, self-sacrifice and service to others. Swamiji said that ‘The word ‘Love’ is very difficult to understand. Every act of love brings happiness. There is no act of love which does not
bring peace and blessedness as its return. Real Existence (Sat), real knowledge (Chit) and real love (Ananda) are intimately connected with one another, the three-in-one, where one of them is, the others must be - the Existence-Knowledge-Bliss”.

**Mahatma Gandhi:** Gandhi (1869 - 1948) has laid emphasis on the specific eleven values. These are – Non-violence, Truth, Non-thriving, Purity (Brahmacharya), Non-acquisitiveness (Aparigraha), Physical work, Control of palate, Fearlessness, Looking up at all religious equally – toleration, Patriotism- love of one’s own country (Swadeshi), Abolition of untouchability.

**Sarvepalli Radhakrishnan:** Radhakrishnan (1888 - 1975) mentioned the values in its statement of aims of education and he has given emphasis on the development of essential values through education. He has laid stress on the Human values, moral values, intellectual values, spiritual values, social values, cultural values, religious values and universal values. Radhakrishnan rightly said that “Civilization are measured with the values they stand for, not the machines they invent and use. They are the individual’s as well as the society’s idea of what is desirable”.

**Sri Aurobindo:** According to Aurobindo (1872 - 1950), the chief aim of education is the building of the powers of the human mind and spirit, evoking of knowledge, character and culture. Education should help the growing soul to draw out that in itself which is best and make it perfect for noble use. He suggested that “the business of both parent and teacher is to enable and to help the child to educate himself, to develop his own intellectual, moral, aesthetic and practical capabilities and to grow freely as an organic being, not to be kneaded and pressured into form like an insert plastic material”.
Rabindranath Tagore: R. N. Tagore (1963) clearly stated that, “we must know that the evolution process of the world has made its progress towards the revelation of its truth – that is to say some inner value which is not in the extension in space and duration in time. When life came out it did not bring with it any new materials into existence. Its elements are the same, which are the materials for the rocks and minerals. Only it evolved a value in them which cannot be measured and analysed. The same thing is true with regard to mind and the consciousness of self; they are revelations of a great meaning, the self-expression of a truth. In man this truth has made its positive appearance, and is struggling to make its manifestation more and more clear. That which is eternal is realizing itself in history through the obstructions of limits”.

Abul Kalam Azad: Abul Kalam (1888 - 1958) considered “Of whatever kind it may be, love is always the first step towards the station of truth and reality ... or, better, love is the door to be passed through before man can become man. Whoever’s heart is not wounded, and whoever’s eyes are not wet with tears – how can he fathom the meaning of humanity?”

B. R. Ambedkar: Ambedkar (1891 - 1956) highlighted that there “... is not enough for religion to consists of a moral code, but its moral code must also recognize the fundamental tenets of liberty, equality and fraternity. Unless a religion recognize these three fundamental principles of social life religion will be doomed...”. He further said that “these principles of liberty, equality and fraternity are not to be treated as separate items in a trinity. They form a union of trinity in the sense that to divorce one from the other is to defeat the very purpose of democracy”.

2.2 Concept and Definition of Perception & Sensation

a) **Etymological meaning of perception:**

According to Lewis (2000), “etymologically, the term ‘perception’ is derived from the old French language term percepcion and literally referred to the collecting of rents by feudal landlords. Cutting observes that the present definition of the term has maintained a degree of this prior usage in that it refers to the collecting of information about the world by means of the senses. In a similar vane, the Latin terms *perception, percipio and perceptionem* mean ‘to take possession of or to seize’, be it physically grasping something or mentally seizing something with one’s senses”. As per The Online Etymology Dictionary (2014), the word (perception), “first used in the more literal sense of the Latin word; in secondary sense, ‘the taking cognizance of,’ it is recorded in English from 1610s. Meaning ‘intuitive or direct recognition of some innate quality’ is from 1827”.

b) **Philosophical meaning of perception:**

Important philosophical problems derive from the epistemology of perception—how we can gain knowledge via perception—such as the question of the nature of qualia. Within the biological study of perception naive realism is unusable however, outside biology modified forms of naive realism are defended. Thomas Reid, in the 18th century, realised that sensation was composed of a set of data transfers but declared that there is still a direct connection between perception and the world. This idea is called direct realism.

The succession of data transfers involved in perception suggests that sense data are somehow available to a perceiving subject that is the substrate of the percept. Indirect realism, the view held by John Locke and Nicolas Malebranche, proposes
that we can only be aware of mental representations of objects. However this may imply an infinite regress, though a finite regress is perfectly possible. It also assumes that perception is entirely due to data transfer and information processing, an argument that can be avoided by proposing that the percept does not depend wholly upon the transfer and rearrangement of data. Indirect realism (representational views) provides an account of issues such as perceptual contents, qualia, dreams, imaginings, hallucinations, illusions, the resolution of binocular rivalry, the resolution of multi-stable perception, the modelling of motion that allows us to watch TV, the sensations that result from direct brain stimulation, the update of the mental image by saccades of the eyes and the referral of events backwards in time. Direct realists must either argue that these experiences do not occur or else refuse to define them as perceptions.

Idealism holds that reality is limited to mental qualities while skepticism challenges our ability to know anything outside our minds. One of the most influential proponents of idealism was George Berkeley who maintained that everything was mind or dependent upon mind. Berkeley's idealism has two main strands, phenomenalism in which physical events are viewed as a special kind of mental event and subjective idealism. David Hume is probably the most influential proponent of skepticism.

A fourth theory of perception akin to naive realism, enactivism, attempts to find a middle path between direct realist and indirect realist theories, positing that cognition arises as a result of the dynamic interplay between an organism's sensory-motor capabilities and its environment. Instead of seeing perception as a passive process determined entirely by the features of an independently existing world, enactivism suggests that organism and environment are structurally coupled and co-
determining. The theory was first formalized by Francisco Varela, Evan Thompson, and Eleanor Rosch in ‘The Embodied Mind’.

**Oxford Dictionary of Philosophy (2008):** Perception- A fundamental Philosophical topic both for its central place in any theory of knowledge, and its central place in any theory of Consciousness. Philosophy in this area is constrained by a number of properties that we believe to hold of perception. (i) It gives us knowledge of the world around us; (ii) We are conscious of that world by being aware of sensible qualities, colours, sounds, tastes, smells, felt warmth, and the shape and positions of objects in the environment; (iii) Such Consciousness is affected through highly complex information channels, such as the output of the three different types of Colour-sensitive cells in the eye, or the channels in the ear for interpreting pulses of air pressure as frequencies of sound; (iv) There ensures even more complex neuro-physiological coding that information, and eventually higher order brain functions bring it about that we interpret the information so received.

c) **Psychological meaning of perception:**

Perception is the bases of all human activities and it is a complex mental processes. But the sensation is the first response of the organism to the stimulus and it is a step in the direction of perception. Sensation is not separated from perception. Actually, Perception is the interpretation of the meanings of sensations. Perception is a mental activity which acquaints us with the situation by giving us direct knowledge of it. The sensations are viewed as a whole, in perception. In perception there is not just a perfunctory acquaintance with the object, there is knowledge of it too. Thus the perception is the experience of an incident that happens or the thing which we see before us. **Woodworth** stated that “In general, when we speak of sensation we are
thinking of stimuli and investigating the relationship of the individual’s experiences to various stimuli which reach his receptors, and when we speak of perception we are thinking of objects and are investigating how well the individual’s experiences correspond with the objective facts.”

Perception is sensation plus thought or meaning. We sense qualities and we perceive objects. Sensation is awareness of objects and perception is the awareness of this or that object. For example, when we hear a sound, it is sensation and when we know that it is a calling bell, it becomes a case of perception. Therefore, perception involves two processes – it involves a sensation of the stimulus by a sense organ and interpretation of stimulus through sensation. According to William James, “Perception is the consciousness of particular things presented to senses.” Fantino and Penolds further said that “Perception is the organising process by which we interpret our sensory input”. Thus the perception is the process of interpreting sensory information from the receptor organs to produce and to organize image of the specific environment. Chakrabarty (2008) given a balanced definition on sensation and perception as, “The primary nerve impulse generated by a stimulus through a receptor organ is called Sensation. When sensation is transformed into a meaningful information after it has been received in the appropriate brain centre and interpreted by its associative function, the process is known as perception.” In other hand Gowda (2010) rightly said, “Perception is any experience that is primarily dependent on sensory input but has content and organization usually derived from previous experience or predisposition. It is a process of interpreting or giving meaning to the sensations received by sense organs (vision, sound, touch and so on). Perception is typically interpreted as a cognitive process, in contrast to sensation, which is usually defined as sensory experience only.”
There are various sources present in the field of research. Some of them used here to further define sensation and perception.

The New Encyclopaedia of Britannica (1943–73): Perception, or perceiving, refers to the process whereby sensory stimulation is translated into organized experience. That experience, or percept, is the joint product of the stimulation and of the process itself. Relation found between various types of stimulation (e.g., light waves and sound waves) and their associated precepts suggest inferences that can be made about the properties of the perceptual process; theories of perceiving then can be developed on the basis of these inferences.

Oxford-Dictionary of Psychology (2009): The act, process or product of perceiving (to engage in perception), the ability or capacity to perceive, or a particular way of perceiving (newspapers influenced the public’s perception of princess Diana). In psychology, a distinction is conventionally drawn between sensation, the subjective experience or feeling that results from excitation of sensory receptors, and perception, sensory experience that has been interpreted with reference to its presumed external stimulus object or event.

d) Meaning of perception in social psychology:

In social psychology, particularly two words, self-perception and social perception are more emphasized. The idea behind self-perception theory (Bem, 1965) is that we form attitudes not due to exposure or associative learning, but from observations of our own behaviour. According to Bem (1965), attitudes are formed from observing our own behaviours (e.g. the opinions we openly express on particular issues) and then attributing them to
either internal or external causes, with internal attributions (inference that the behaviour is indicative of an attitude) more likely when the behaviour was freely chosen.

In the other side, social perception has been recognized by social psychologists as a central aspect of social thought and an important foundation of social behavior. It is the fact that social perception is a complex task and we devote a lot of effort to understand others but many times these efforts do not succeed. Indeed, the social perception “involves the processes through which seek to understand other persons. It plays a key role in social behavior and social thought” (Baron, et al. 2008).

e) Educational meaning of perception:

The researcher has already stated the ‘educational meaning of perception’ in operational definition of the term ‘Perception’ in this study. It is further given below: According to the Dictionary of Education (2004), perception is “The way in which a person views his or her environment based on the sense, past experience, attitudes, awareness, current information and other personal variables. It is a continuous process of integration of present and past sensory impressions”.

2.2.1 Categorization of Perception

We may categorize the perception as **internal** or **external**.

- **Internal perception** tells us what is going on in our bodies; where our limbs or parts of the body are, whether we are sitting or standing, whether we are hungry, tired and so forth.

- **External** or **Sensory perception**, tells us about the world outside our bodies. Using our senses of sight, hearing, touch, smell, and taste, we perceive
colours, sounds, textures, etc. of the environment. There is a growing body of knowledge of the mechanics of sensory processes in cognitive psychology.

- **Mixed internal and external perception** (i.e., emotion and certain moods) tells us about what is going on in our bodies and about the perceived cause of our bodily perceptions.

### 2.2.2 Functions of Perception

According to Holzman (1963) “It is a psychological point of contact between ourselves and our environment. Its principal function is to carry information from the environment for integration with other psychological function, such as learning, memory, judgement, and anticipation. Through perceiving we get information not only about external reality but also about the consequences of or actions on that reality. Effective perceiving thus contributes to effective adaptation to our environment”.

Perception is more than the sum of static, individual sensory inputs. Perception clearly involves some integration and, perhaps, some interpretation of the sensations we receive. Perception is not a matter of simply taking in information from the world and creating from it a duplicate internal representation. Perception sometimes involves ‘seeing’ things that are not there (i.e. subjective contours) or distorting things that are (i.e. other context effects). Perception involves both bottom-up processes, which combine small bits of information obtained from the external environment into larger pieces, and top-down processes, which are guided by the perceiver’s expectations and theories about what the stimulus is.

As per Wikipedia (2014), “Perception is a cognitive process in which information processing is used to transfer information into the mind where it is related
to other information. Some psychologists propose that this processing gives rise to particular mental states (cognitivism) whilst others envisage a direct path back into the external world in the form of action (radical behaviourism). Behaviourists such as J. B. Watson and B.F. Skinner have proposed that perception acts largely as a process between a stimulus and a response but have noted that Gilbert Ryle's ‘ghost in the machine of the brain’ still seems to exist. ‘The objection to inner states is not that they do not exist, but that they are not relevant in a functional analysis’. This view, in which experience is thought to be an incidental by-product of information processing, is known as epiphenomenalism. Contrary to the behaviouralist approach to understanding the elements of cognitive processes, Gestalt psychology sought to understand their organization as a whole, studying perception as a process of figure and ground’.

2.2.3 Relation and Difference between Sensation & Perception

Our five sense organs (i.e. eye, ear, nose, tongue and skin) are called the gateways of knowledge. All information from the outside world would come to us through these five sense organs and get the sensation of seeing, hearing, smell, taste and touch. Apparently, there are different types of sensation, but they can be divided into the three categories:

(i) Organic sensations; (ii) Special sensations; (iii) Motor sensations.

Special sensations correspond to our five sense organs, e.g., visual, auditory, olfactory, gustatory and tactual.

Perception involves two processes, first is a sensation through the stimulus of sense organ/s and 2nd is the interpretation of the sensation. In practice, sensation is not separated from perception and they are closely related to each other. But distinctions between them are necessary for the present context.
i) Sensation is the first response of the organism to the stimulus and perception is the interpretation of the meanings of the sensations.

ii) A Sensation is an elementary mental process and it is a simplest form of mental life. But perception is a mental activity which acquaints us with the situation by giving us direct knowledge of it.

iii) Sensation is awareness of objects, but perception is the awareness of this or that objects with their qualities.

iv) The nature of sensation is mainly determined by the stimulus. In other hand perception is the combination of sensation and the previous experiences of the individual.

v) Sensation is caused only by the presence of the stimulus. But, both the presence of the stimulus and the recapitulation of past experience are necessary in the perception.

vi) Proper stimulation is necessary for pre-condition of sensation but the favourable mind-set is essential conditions for accurate perception.

2.2.4 Relation between Attention and Perception

The conditions that are essential to attract attention are also necessary for perception. Because perception is not possible without attention. Perception depends on some conditions of stimuli. These are intensity, repetition, novelty, intention and motivation.

- The **intensity of stimulus** easily attracts our whole attention. We immediately attracts to a red lamp.

- Stimulus becomes stronger in continuous **repetition**. Repetition quickly attracts to our attention and we get perception of any things.
• **Novelty of stimulus** is an important condition for attention. New things appear more attractive to us, because they differ from earlier things. Corporate house frequently use this condition in their advertisement of products.

• Our attention goes towards an object according to our **intention** of mind. While in a festival, the attention of a fashion designer goes to dress code of male-female, because he gets the perception of that fashion only.

• Specific **motivation** attracts towards an object. If motivation is present in our mind relating towards an object, then we get perception very quickly.

### 2.2.5 Nature and Characteristics of Perception

After analyses of the nature of perception, earlier psychologists gave the important characteristics of perception. They are discussing below:

a) Perception depends on some changes in the external environment. This World is ever changing and the changing process often attracts our attention in some specific direction. This process is responsible for our perception of various matters.

b) Perception is the result of previous experience. Actually, Perception is sensation plus meaning. This meaning is determined by the previous experience of the individual, through his/her education, culture and other things.

c) Perception process is always well organised and it is a complex act of mind. In this process, it is not only single organ works, may be more in the operational sphere of a specific organ. In this process an organ succeeds in understanding even most complex changes with the help of brain.

d) Perception varies with attention. The objects which are liked by the perceiver attract his/her attention easily.
e) The area of perception is determined by the perspective of the individual who perceives. Actually perception varies according to individual’s subjective and objective point of view/s.

f) Perception depends on individual’s selection process. Our sensory organs select some specific stimuli at a time and responses towards them. Accordingly, we have perception of particular selected object.

g) Perception is influenced by goals. Psychologists have discovered that human-mind influences on the content of perception. Our mind is always related with the broader and specific goals of life.

2.2.6 Necessary Conditions for Accurate Perception

There are necessary conditions of accurate perceptions, which are given below:

- To get accurate perceptions, it is essential to be free from emotional problems. Emotional problems of a person may be related to his / her body or environment.
- When a person is not free from prejudices about an object, then his /her view may be according to those prejudices. Thus the person should be free from biasness for accurate perceptions.
- At the time of perception of a specific object, other stimuli divide a person’s attention and then his / her perception may become inaccurate.
- In-adequate functions of sense organs, such as defective eyes or ears can disturb for accurate perceptions.
- Fatigue, anxieties etc. can disrupt adaptive perception.
• Serious personal problems may turn person’s attention, interest and motivation from real world. This situation has the effect of making them less responsive to stimulation from the outside.

• To get accurate perceptions in each field, specific training is necessary and then illusion being avoided.

2.2.7 Major Influences towards the Realization of Perception

Our mind has a number of influences on the perceptual organisation. Some of them are given below:

a) Influence of environment: Our perceptual reactions depend on the external environment. If there is a change (as examples, heavy rain or storm) in the external environment then we feel it. Because every changing process often attracts our attention in some specific direction.

b) Influence of emotion: The emotional state of mind prepares the bases for the coordination of different objects producing sensation.

c) Influence of past experience: Perception is influenced by the past experiences. The person’s background, like family background, educational background, cultural background, working experience etc. highly influences the process of perceptual organisation.

d) Influence of mental set and aspects: Human instincts have an important part in perceptual organisation. Various objects which are directly related to human instincts, combine together to form a whole in perceptual organisation. There are also various mental processes involved in perceptual organisation. Observation, attention, interest, attitude, motivation, concept, imagination etc. also take important part to play in perceptual organisation.
e) **Influence of personal needs:** The role of personal needs is also important, because human mind has a natural tendency to combine the satisfying sensations produced by the objects which satisfy the personal needs of human.

f) **Influence of community:** The influence of greater community also determine the nature of person’s perceptual organisation. Various cultural heritage, festivals, social gathering, customs, religious culture etc. have a great impact on the process of perceptual organisation.

### 2.2.8 Effect of Technological Advancement on Our Sense Perception

Technology is always helping us for accurate perception. As per **NCERT (2014)**, “The advancement in technology (e.g., use of audio-visual, multi-media, animation, etc.) in some ways, deepens our sensory contact with reality while also reducing it at other levels. In the near future, technology will extend and deepen our natural perceptions by making our sense perception more evolved. We will see more of the world, penetrate into its mysteries more fully with our senses, and perceive it more accurately than we do today. With virtual worlds becoming a reality the only fear is that we may lose contact with reality in some sense.”

### 2.2.9 Concept about Perceptual Development

Perceptual development is the emerging capacity to detect information from the environment and from internal sources to adapt to and function within the world. In the textbooks of educational psychology, a little attention is given to sensation and perception. Most of them mention information processing theories of knowledge acquisition and include a three (3) component model of human memory consisting of sensory registers, short-term working memory and long-term memory. The other side of the textbooks in which sensations and perceptions are mentioned concerns students
with special needs, such as visual and auditory impairment. The five (5) sensory systems that focus on external information, two (2) sensory systems that provide on internal information, coordination of information from multiple sensory sources, on the coordination of the perceptual and motor systems and overall development of brain are taken important role for perceptual development.

**Visual perception** continues to develop and become more efficient throughout childhood. For example, visual skills become better focused, better organized, and more confined to meaningful natural features at early age. **Auditory perception** continues to develop during the period of childhood. For example, the ability to detect low-frequency sounds develops throughout childhood. It is fact that researchers have given little attention to the senses of smell, taste, and touch than vision and audition. But these 3 senses are functional early on, and they may be adaptive to the survival of the Childs. For example, within the 1st week of newborn babies recognize and turn to smell of their mother over that of another woman. Newborn babies also discriminate among different tastes and touches. Other important areas are not discussed at present. Actually, perceptual development continues well beyond at infancy.

**2.2.10 Individual Difference in Perceiving**

It is evident that there are clear differences in perceptual functioning among individuals, among different ages, among different sexes, among different cultures, among classes of individuals, and within the same person from one occasion to another. There are various empirical evidences for **age-related changes** in perceiving among individuals. Both decreased and increased susceptibility to various optical illusions with increasing age. Anatomical and physiological changes in the five sense
organs itself also may account for some age related perceptual changes. **Sex differences** in perceiving, can be showed in research on differences in the style with which people perceive. “In North American studies, female subjects tend to be more field dependent than are males, especially after puberty. Perhaps these results are distinctive of cultures in which females are at least implicitly trained to be passive and perceptually diffuse, and in which males are encouraged to assume an active, perceptually articulated stance” (The New Encyclopaedia of Britannica, 1943–73). There is also evident that more general **cultural influences** are present on perception. Various researches show that the type of physical environment people construct themselves (like African people, Zulu, Masai and Bushmen) to inhabit can influence their style of perceiving. “Analogous effects with different classes of illusion have been shown for other peoples who live in a perceptually unique environment” (The New Encyclopaedia of Britannica, 1943–73). A person’s perceptions may be influenced by various factors, such as his / her expectancies, needs, motives, values, and conflicts. Thus the perception depends upon individual’s attention, interest, motivation, observation, interest, attitude, concept, intelligence, personality and also selection process. These characteristics differ from man to man. Thus the area of perception is determined by the perspective of the individual who perceives and it varies according to individual’s subjective and objective point of views.

2.2.11 Views of Different Schools of Psychology on Perception

Different schools of psychology tried to explain the processes involved in perception. Our general concept is that the perceptual experiences typically have external referents and that they are meaningfully organized, most often as objects (such as books. Pens, chairs, desks etc.). These meaningful objects are normally seen rather than separately perceived as the dots, lines, colours and other elements of
which they are composed. Many earlier researches in perception are directed toward inferring specific features of brain function from such behaviour as the reports (introspections) people give of their sensory experiences and in other side many investigators trusted on those introspective reports. A serious conflict was raised in the 1920s about ‘introspections process’ by J.B. Watson and others. They argued that it yielded only subjective accounts and that precepts are inevitably private experiences and lack the objectivity commonly required of scientific disciplines. “In response to objections about subjectivism, there arose an approach known as behaviourism that restricts its data to objective descriptions or measurement of the overt behaviour of organisms other than the experimenter himself. Verbal reports are not excluded from consideration as long as they are treated strictly as public (objective) behaviour and are not interpreted as literal, reliable description of the speaker’s private (subjective, introspective) experience. The Behaviouristic approach does not rule out the scientific investigation of perception; instead, it modestly relegates perceptual events to the status of inferences. Precepts of others manifestly cannot be observed, through their properties can be inferred from observable behaviour (verbal and nonverbal). … Behaviourism does not proscribe sources of hypotheses; it simply specifies that only objective data are to be used in testing those hypotheses” (The New Encyclopaedia of Britannica, 1943–73). Generally, Introspectionists and Behaviourists believed that any complex mental state is a combination of some component parts and such combination occurs as a result of association. According to their views, perception is nothing but the combination of a number of sensations. But the Gestalt School of Psychology dismisses this interpretation. Their view is that the perception is not simply the combination of sensations, it is much more than that. The founder of Gestalt theory, Max Wertheimer and Gestalt psychologists K. Koffka & W.
Koheler, rejected the earlier assumption that “perceptual organization was the product of learned relationships (associations), the constituent elements of which were called simple sensations. Although Gestaltists agreed that simple sensations logically could be understood to comprise organized percepts, they argued that percepts themselves were basic to experience. One does not perceive so many discrete dots (as simple sensations), for example; the percept is that of a dotted line” (The New Encyclopaedia of Britannica, 1943 – 73). A major goal of this school in the 20th century was to specify the brain process that might account for the organization of perception. In the language of ‘Gestalt School’, immediate human experience is of organized wholes (Gestalten), not of collection of elements. ‘Gestalt’ means ‘shape’ or ‘form’. “In psychology, the term implies any of the unified patterns or structures that make up experience and have properties that cannot be reduced to component parts or elements of the whole, so that the unity of the whole is more than the sum of the parts” (Gowda, 2010). Max Wertheimer has already shown that every perception process is a unique configuration or as a whole that cannot be explained by an analysis of its constituents parts. Gestalt School have also offered many principles of how we accomplish this task, including the principles of proximity, similarity, good continuation, closure, and common fate. All of them follow the ‘law of Prägnanz’, which states that of all the possible interpretations a perceiver could make of a stimulus, he or she will select the one that yields the simplest, most stable form. According to Gestalt School, “Perception involves a great deal of patterning or filling in from one’s mental make-up. We normally approach our environment with certain expectations as to what we are likely to perceive, and we tend to interpret various stimuli in terms of these expectations. In other words, we make sense of what we perceive by organizing and reorganizing it to fit into our schema” (Gowda, 2010).
Actually, our perception depends on the dictation and direction of our brain. William James described it as, “What we perceive comes as much from inside our heads as from the world outside.” Cognitive psychologist Frank Smith (1975) furthermore said “We perceive what the brain decides is in front of our eyes”. Thus the perception implies relating aspects of sensory experience to the cognitive categories already formed in our brain. Actually sensation, perception and comprehension (meaningful interpretation) are the integral phases of whole cognitive processes.

2.2.12 Correct Perception versus Misperception

There is no correct perceiving in the sense that there is only one proper way to see things. For an example, to see the lights moving around in an advertisement board, although in reality we know the lights are not moving at all, but lights are blinking with adjusted rate. There are certain limits and also differences among individuals about effective perception. “Such individual differences in perceiving generally do not indicate the operation of distorting mechanisms, but rather reflect individual ways people have of bringing sense organ experiences into relation with each other, with their past experience, and with their own standards of adequacy” (Holzman, 1963). Disruptions of perception (as in visual agnosias, including prosopagnosia) involve not understanding or recognizing what is seen. Apperceptive agnosias involve intact recognition of contours but an inability to recognize what the object is. Associative agnosics can (sometimes, slowly) recognize the identity of objects but focus intently on small details. Prosopagnosia is an inability to recognize faces, perhaps of relatives or of famous people, or even one’s own reflection or photograph.

So many factors present in this environment and within us, which are causes of mis-perception. “The medium through which the physical energies are transmitted
may interfere with perception. For example, a stick submerged in a tank of water is really not where it seems to be” (Holzman, 1963). Inadequate functions of sense organs (as example, defective eyes or ears), specific damage to certain parts of the central nervous system, physical and mental illness or fatigue, mental stress, emotional crises, anxieties, person’s internal conflicts, serious personal problems, unstable environmental circumstances etc. are the main causes for misperceiving. Lastly, any type of maladaptive action such as misrecognition or misjudgement involves in the event of misperceiving.

2.3 Concept and Definition of ICT

Learners gained experiences for learning through direct and indirect ways. First hand or direct experience is not always possible in teaching-learning environment. Most of the learning experiences are come from second hand experiences in the form of information about the matters, objects, places, events, ideas or persons. This whole information provides a standard base for knowledge and understanding. Therefore the learners must be able to learn to get information, store and use them when required. Such type of activities is called Information Technology (IT). As per Dictionary of Computer and Information Technology (2006), “IT is the application of appropriate (enabling) technologies to information processing”. But ‘Information Technology’ remains incomplete without any communication process or system. Actually, communication is a two-way process for sharing of ideas, beliefs, thought and information with each other. Communication means, “Flow of information from one point (the source) to another (the receiver). Electronic transfer of information from one location to another. Data communications refers to digital transmission, including analogue voice and video. Protocol is the way of communications systems ‘talk to’ each other” (Dictionary of Computer and Information Technology, 2006).
Thus the mutual sharing of information to each other tends to add in its increase, understanding and usage help in managing knowledge. Therefore, both information and communication are very essential for knowledge management. At present, the scope and advantages in the activities selected to information and communication is availed from ‘Information and Communication Technology’ (ICT). According to UNDP (2001), ICTs are basically information-handling tools – a varied set of goods, applications and services that are used to produce, store, process, distribute and exchange information. UNESCO (2007) clearly said that, “The term ‘information and communication technologies’ (ICT) refers to forms of technology that are used to transmit, process, store, create, display, share or exchange information by electronic means. This broad definition of ICT includes such technologies as radio, television, video, DVD, telephone (both fixed line and mobile phones), satellite systems, and computer and network hardware and software, as well as the equipment and services associated with these technologies, such as videoconferencing, e-mail and blogs”.

Mangal and Mangal (2009) stated that the “information and communication technology is that type of technology employed in the shape of tools, equipment and application support which helps in the collection, storage, retrieval, use, transmission, manipulation, and dissemination of information as accurately and efficiently as possible for the purpose of enriching the knowledge, developing communication, decision-making and problem solving ability of the user”. Indian ‘National Policy on Information and Communication Technology (ICT) In School Education (2012)’ stated a comprehensive view on ICT, which is given here: “Information and Communication Technologies are defined as all devices, tools, content, resources, forums, and services, digital and those that can be converted into or delivered through digital forms, which can be deployed for realising the goals of teaching learning,
enhancing access to and reach of resources, building of capacities, as well as management of the educational system. . . . These will not only include hardware devices connected to computers, and software applications, but also interactive digital content, internet and other satellite communication devices, radio and television services, web based content repositories, interactive forums, learning management systems, and management information systems. . . . These will also include processes for digitisation, deployment and management of content, development and deployment of platforms and processes for capacity development, and creation of forums for interaction and exchange”

Thus the ICT are a diverse set of technological tools and resources used to communicate, and to create, disseminate, store, and also manage information. ICTs help us communicate more effectively by the use of various devices or tools. Information and communication are the cornerstones of the educational process. Now ICT has been playing an important role in formal and non-formal educational settings. We are in more need of ICT to have complete access of the knowledge, mastery over the knowledge getting process and potential use of new knowledge. ICT can be used for a wide range of educational era to build-up a knowledge society.

2.3.1 Origin and Growth of ICT

Invention of paper, ink and after that print media may be mentioned as the primary step in the evolution of ICT. Movable type invented by Gutenberg in the possible year of 1438 in Germany. It was a landmark of the development of ICT. It was further advanced through the inventions related to Graphite Pencil (1565), Arithmometer, forerunner of the calculator (1820), Light Bulb (1883), Photography (1849), Photostat (1900), Xerography (1938), Micrography (1940), Laser Technology (1960), Magnetic Video Camera, Video Disc and Computers (last 3 developed in 20th
century). Furthermore, the development made also in the area of ‘Telecommunication Technology’ in the way of the invention of Telegraph (1837), Telephone (1876), Radio (1895), Television (1925), Communication Satellites (first satellite Sputnik in 1957) and Fax Machine (in 20th century). A serious attempt was taken for the direction of exercising scientific control over the process of information and communication, in the last half of the 19th century in U.S.A. The term ‘Information Science’, later called ‘Information and Communication Technology (ICT)’ was first mentioned in the year 1950 for the effective handling of the interchange of scientific information among the scientists in U.S.A. and different foreign countries. After that, around the year 1960, it was begun to be used in the industrial field. At present we may discover its wide application in every area of global society. The modern ICTs have brought a revolution in the field of industry, trade & commerce, banking, agriculture, medical science, transport, judiciary, science & technology, postal & telecommunications, manufacturing & service sector, military science, various other fields and also education.

2.3.2 Old ICT versus Modern ICT

There is no scope of contradiction between old ICT and modern ICT. It is always considered that the old system is the bases of modern establishment. UNDP (2001) has clearly mentioned the traditional or old ICTs like as radio, television, telephone, slide projectors, overhead projector (OHP), tape recorder, videocassette recorder, filmstrip etc. According to them, the modern or new ICTs are computer, laptop, tablet, ipad, interactive TV, internet, email, chat, audio/video conference, multimedia projector, LAN, WAN, voice recorder, digital & web camera, data and media storage devices like CD, VCD, DVD, pen drive etc. Now it can be shown in the following table:
**Table No. 2: Classification of Old ICT and Modern ICT**

<table>
<thead>
<tr>
<th>OLD ICT</th>
<th>MODERN ICT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Print media like as Textbook, Resource &amp; Reference Book, Study Material, Journal etc.</td>
<td>Personal Computer (PC), Laptop, Notebook</td>
</tr>
<tr>
<td></td>
<td>Word Processing Spreadsheets, PowerPoint Presentation (PPT).</td>
</tr>
<tr>
<td>Different Materials such as Picture, Cartoon, Poster, Chart, Map, Graphical Diagram etc.</td>
<td>Different type networks like LAN (local area network), MAN (metropolitan area network), WAN (wide area network).</td>
</tr>
<tr>
<td></td>
<td>LCD (Liquid Crystal Display) or DLP (Digital Light Processing)</td>
</tr>
<tr>
<td>3D Aids like as Model, Specimen, Puppet, Mockery, Drama etc.</td>
<td>CD ROM, DVD, Pen drive, SD card etc.</td>
</tr>
<tr>
<td></td>
<td>Digital Video Camera, Web Camera.</td>
</tr>
<tr>
<td>Ideas and Thought shared with Peer Team, Resource Persons, Teachers, Parents etc.</td>
<td>World Wide Web (WWW), Internet, email, SMS, MMS, Hypermedia and Hypertext resources,</td>
</tr>
<tr>
<td></td>
<td>Multimedia Laptop, Tablet &amp; Smart Mobile</td>
</tr>
<tr>
<td>Audio-Visual Aids such as Radio, Tape, TV, Overhead &amp; Slide Projectors, Motion Picture or Film, Audio-Video Recorder etc.</td>
<td>Computer-mediated Tele Conferencing and Video Conferencing System.</td>
</tr>
<tr>
<td></td>
<td>Tele &amp; Video Text, Interactive Video Disk (IVD),</td>
</tr>
<tr>
<td></td>
<td>Interactive Remote Instruction (IRI)</td>
</tr>
<tr>
<td></td>
<td>Library Automation and Digital Libraries</td>
</tr>
<tr>
<td></td>
<td>Online Admission and Examination</td>
</tr>
<tr>
<td></td>
<td>e-Commerce and e-Governance system.</td>
</tr>
<tr>
<td></td>
<td>Skype, Facebook, Twitter, WhatsApp etc.</td>
</tr>
<tr>
<td></td>
<td>Virtual Reality, Virtual Classroom, Virtual College &amp; University.</td>
</tr>
</tbody>
</table>

** (Adapted from the Books of Mangal and Mangal, 2009)

2.3.3 Overall Advancement of Modern ICT

ICT can play vital role in our information and communication processes and its outcomes give us various significant changes and advantages. ICT have brought a paradigm shift in every field of human civilisation. ICT is an umbrella that includes all technologies for the manipulation and communication of information. ICT makes more explicit that technologies can play vital role in every sector. The major technological advancement is influencing the ICT, which is given below:
Microprocessors: After the invention of microprocessors, size of the computers was reduced and increased its capacity. There are various designs of microprocessors available, such as Specialized High Performance Auxiliary Processors, Processor Mimics, Multi-Processors systems etc.

Storage and memory technology: Technological Advancement in Storage and memory is a significant aspect of modern ICT. Numbers of Optical memory devices (CD, DVD, SD CARD, Pen Drive, MP3, MPEG etc.) are available for huge capacity of storage.

Communication Technologies: Significant changes are visible in communication technologies. These are: Digitalization of sound, images and data; Digital data compression; Development of electronic components like, Telephone or Mobile, Radio, TV, PC (Personal Computer); Wide range new innovations attach with Internet, Radio-TV broadcasting system, Satellite Networks etc.

Reprographic – reproduction of documents: Vallikkad (2009) stated that “Reprography is a general term for the reproduction of documents or images especially those that are virtually indistinguishable from the original. Reprography can be by mechanical, electronic, or photographic means such as photocopying or xerography, scanning, digital printing, and photography.” It is also known in different names like as photocopying, xerography, photographic reproduction etc. The reproduction and copying of information are very important in the field of education. Reprography is normally used in library and archives, as well as in the architectural, engineering and construction industries. The reproduction system of reprography are dependent
on several technologies and the typical reproduction methods are electrostatic (xerographic), diazo (blue line), photographic, laser, ink jet etc. According to Vallikkad (2009), “Reproduction can be made from the same size or smaller/larger hard copy originals. Prints can also be computer generated from CADD (Computer Aided Design and Drafting) files or from a growing variety of desktop publishing and design software packages. . . . Typical items produced by reprographers include architectural/engineering blueprints and renderings, indoor and outdoor signage, maps, billboards, backlit displays, trade show graphics, legal and medical exhibits, etc.” Thus, the reprography is an important technological advancement of ICT.

Micrographic Technology: By this technology, all types of micro documents transparent or opaque or in roll or sheet are possible. Microform is a generic term for any type medium, transparent or opaque, bearing micro images. A micro image is a small unit of textual, graphic or computer generated material that is contained on micro cards, microfilm, microfiche, micro opaque etc. Microforms may be reproductions of existing textual or graphic materials or from original documents. Any type of microforms contains micro reproductions of documents for transmission, storage, reading and printing. Thus the micrographic technology is a major technological advancement that is influencing ICT.
2.3.4 Scope of ICT in the field of Teaching and Learning: A New Paradigm

In the 21st century, teaching and learning are inseparable from modern technology. Tremendous advances in ICTs and particularly, internet have changed our life. Today we live in a very complex, interrelated and knowledge-driven world. US Department of Labour (1999), previously said: This new era is “powered by technology, fuelled by information and driven by knowledge”.

This new environment involves a drastic change in the roles of teachers and students. A paradigm shift from teacher-centered learning environment to learner-centered learning environment is needed in every educational institution. The traditional role of teacher will change from knowledge transmitter to learning facilitator, collaborator and co-learner. In the other side, students will more responsible to take part as an active participant in the whole learning process, they find out, synthesize the knowledge and also share it with others. According to Holmes (1999), “the potential use of ICT in educational setting goes far beyond the provision of direct instruction. In the domain of instruction, though there are broad classes of applications, ICT can be applied as an object of Instruction, as a tool for Instruction and as instructional materials.” Thus ICTs provide important tools to support the shift from teacher-centered instruction to learner-centered instruction and the new roles of both teachers and students. According to Newby et al. (2000), the following table identifies the changes in student and teacher roles in learner-centred environments.
Table No. 3: Changes in Student and Teacher Roles in Learner-Centered Environments

<table>
<thead>
<tr>
<th>Changes Role of:</th>
<th>A Shift from:</th>
<th>A Shift to:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Teacher</strong></td>
<td>Knowledge transmitter, primary source of information, content expert, and source of all answers.</td>
<td>Learning facilitator, collaborator, coach, mentor, knowledge navigator, and co-learner.</td>
</tr>
<tr>
<td></td>
<td>Teacher controls and directs all aspects of learning.</td>
<td>Teacher gives students more options and responsibilities for their own learning.</td>
</tr>
<tr>
<td><strong>Student</strong></td>
<td>Passive recipient of information.</td>
<td>Active participant in the learning process</td>
</tr>
<tr>
<td></td>
<td>Reproducing knowledge.</td>
<td>Producing and sharing knowledge, participating at times as expert.</td>
</tr>
<tr>
<td></td>
<td>Learning as a solitary activity.</td>
<td>Learning collaboratively with others.</td>
</tr>
</tbody>
</table>

** (Table adapted from the works of Newby et al., 2000)

Citizens of the World have been realizing that ICT can help to provide access to quality teaching and learning for all. A global citizen must be equipped with ICT knowledge and skills. In the present context, role of teacher educators and teachers become crucial day to day. It is widely accepted in the world that the impact of teachers on student learning is effective. They are the actual key persons to bring about the new paradigm of teaching and learning. From this background, ‘The Assessment and Teaching of 21st Century Skills (ATC21S) Consortium (2013)’ have identified the following scope and skills on importance in today’s knowledge society:

a) Ways of thinking: Creativity, critical thinking, problem solving, decision making and learning.

b) Ways of working: Communication and collaboration.

c) Tools for working: ICT and information literacy.

d) Skills for living in the world: Citizenship, life and career skills and personal and social responsibility.
In fact the necessary changes in future teaching and learning with ICT which have taken place are not fully appreciated, as the difference between ‘actual use’ and ‘potential use’ is not being reduced; i.e. the targets are moving at the same rate as practice.

### 2.3.5 Importance of ICT in Teacher Education

ICT has impacted on all aspects of society over recent years, teacher education is no exception. Realizing the importance of the role of teacher educators and teachers in propagating ICT skills among the students and using ICT to make teaching and learning more enjoyable, more interactive as well as more effective, UNESCO (2008) has designed the ICT Competency Standard for Teachers (ICT-CST) project. In this ‘ICT-CST Policy Framework (UNESCO, 2008)’ pointed out that ‘New technologies require new teacher roles, new pedagogies and new approaches to teacher training. The successful integration of ICT into the classroom will depend on the ability of teachers to structure the learning environment in non-traditional ways, to merge new technology with new pedagogy, to develop socially active classrooms, encouraging cooperative interaction, collaborative learning and group work. This requires a different set of classroom management skills to be developed. . . . Teacher professional development will be crucial component of this educational improvement’.

Thus, the challenge to the teacher educators and teachers is to be more important in using ICT. Teacher education programme need to be developed their curriculum for effective uses of technology in teaching and learning process. Teacher education institutions are equipped with ICT tools, resources like as interactive
computer simulations, multimedia system, digital and open educational resources, sophisticated data gathering & analysis tools etc.

We always remember the instructional role of ICT in learning process. ICT alone, “does not produce learning; technology is a tool that can be used in many ways, to enhance learning. The literature generally describes three major categories of instructional use for computer based technologies; these are learning from the technology, learning about the technology and learning with the technology” (Senapaty, 2009). The high expectation of the important role of ICT, which could play in the teacher education institutions for both opportunities and challenges for those involved in its implementation and application for teaching-learning.

**2.3.6 Application and Integration of ICT in Teacher Education for Teacher’s Professional Development and Commitment**

Now we have to think to modify our teacher education system according to the changing demands of our nations, with the help of new technologies. Full application and integration of ICT in teacher education is difficult task but it can be achieved by sincere joint efforts of teacher educators and prospective teachers from every corners of this country.

Education communities around the World are under tremendous pressure to use ICT to teach students the competencies and skills they need in the present Century. Due to the influence of ICT, teachers are changing their traditional role from just as knowledge transmitter to facilitator in a constructivist teaching learning environment. A great responsibility of teaching communities arises to promote, utilize and implement ICT in education. Now it is very essential that all teachers are able to use
ICT for the new techno-pedagogies, generation of learning input and dissemination of knowledge. But there is a wide gap between teacher education and school education programme. Teacher education institutions and their programmes have the critical role to provide the proper leadership in adapting pre-service and in-service teacher education to deal with the present demands of society. Different forms for the application or use of ICT and different approaches for the Integration of ICT in teacher education are urgent needs in the context of professional development and commitment of teaching community.

- Application or Use of ICT in the Learning Process through Different Forms:

The application or use of ICT as an important part of the learning process can be subdivided into three (3) different forms: as object, aspect, and or medium (Plomp, ten Brummelhuis, and Pelgrum, 1997). These three forms are discussed below:

i. **Object:** As object, one refers to learning about ICTs as specific courses such as computer education. Learners familiarise themselves with hardware and software including packages such as Microsoft Word, Microsoft Excel, and others. Here computers can be considered as an ‘object’ which students learn about hardware and software. The main aim is computer literacy.

ii. **Aspect:** As aspect, one refers to applications of ICTs in education similar to what obtains in industry. The use of ICTs in education, such as in computer-aided design (CAD) and computer-aided manufacturing (CAM), are examples. Here, computer technologies can be an ‘aspect’,
which means using them as tools in subjects such as CAD courses, or as general tools in educational settings, i.e. the use of graphic design software to create web pages for a school.

iii. **Medium:** ICTs are considered as a medium whenever they are used to support teaching and learning. As example, computer technologies are the ‘medium’ for educational instruction. Here, computer technologies can be used for teaching and learning purposes in various ways.

**Potential Use of ICT in Educational Setting as Multi Instructional Tool:**

According to Thamarasseri (2009), “the potential use of ICT in educational setting goes far beyond the provision of direct instruction. In the domain of instruction, though there are broad classes of applications, ICT can be applied as an object of Instruction, as a tool for Instruction and as instructional materials.”

ICT can be used as multi tool in the processes of teacher education in the following ways:

a) **Informative Tool:** ICT provides large amount of data in several formats like as documents, digital contents or texts, audios, videos, pictures etc. It helps for gathering of new knowledge or information.

b) **Communicative Tool:** ICT tool can be used to remove different communication barriers like as place, person, and time. ICT strengthen the all type communication system in global society.

c) **Situating Tool:** ICT tool easily creates virtual situations, which the learners experiences in real essence of life. It is widely used and accepted as virtual reality in education.
d) **Constructive Tool:** Some ICT tool can be used to manipulate the raw data and generate analysis.

**Integration of ICT in Teacher Education for Professional Development and Commitment of Teachers through Different Approaches:**

There is a growing need for different approaches to integrate ICT in pre-service teacher education programmes. Four important approaches like as “ICT skills development approach, ICT pedagogy approach, Subject-specific approach and Practice driven approach” are suggested by Khirodkar (2008). These are described below:

i. **ICT skills development approach:** This approach has given importance to providing training in the use of ICT in general. Student teachers are expected to be skilled users of ICT for their regular activities. Knowledge about different software, hardware and their use in educational process is provided.

ii. **ICT pedagogy approach:** This approach has given emphasis on integrating ICT skills in respective subjects. Based on the principles of constructivism, pre-service teachers design lessons and related activities that center on the use of ICT tools which will foster the attainment of learning outcomes. It is more useful as it enhances ICT literacy skills and the underlying pedagogy allows students to further develop and maintain these skills in the context of designing classroom-based resources and materials.

iii. **Subject-specific approach:** In this approach, ICT is embedded into one’s own subject area. By this approach, students are exposed to new and
innovative ways of learning and to practical understanding of what learning and teaching with ICT looks and feels like by teachers or subject experts. In this way, ICT becomes an integral tool that is accessed by teachers and students across a wide range of the curricula.

iv. **Practice driven approach:** This approach has given emphasis on providing exposure to the use of ICT in practical contexts of teacher education. Major focus is on developing lessons and assignments. Using ICT and implementing it in their personal work experience at various levels provides learners an opportunity to assess the facilities available at their institution and effectively use their own skills.

Besides these four approaches, two (2) other approaches such as “Capacity building approach and Constructivist approach” are also to be used in this context according to Bhattacharyya (2012). These two approaches are as follows:

i. **Capacity Building Approach:** Teacher educators will be perfectly oriented and trained to use ICT in pre-service teacher training programs. They have to sensitize pre-service teachers to practice the use of ICT.

ii. **Constructivist Approach:** The use of ICT is to be promoted to encourage interaction and cooperation among the learners, teachers and experts and to integrate theories to practice. The teaching learning environment is to be revamped so as to suit the constructivist approach that gives stress on critical thinking of learners and decreases memorization and rote learning.

From the above approaches, regarding ICT as a core component at the pre-service level, integration of all approaches would help in developing proper attributes among prospective teachers. Furthermore, the ‘National Policy on Information and
Communication Technology (ICT) In School Education (2012)’ already suggested on ‘Capacity Building of In-service Teachers, Pre-service Teachers, School Heads and State / District Department Personnel’. Therefore, it should need a joint effort of teacher educators, pre & in service teachers, school heads and state / district department personnel in implementing and sharpening ICT skills for full integration of ICT in teacher education and school education simultaneously.

2.3.7 ICT in the World Perspective

Educational systems around the world are under continuous pressure to multi-use of the ICTs to teach learners the optimum knowledge, awareness and skills they need in the 21st century. The UNESCO World Education Report (1998) discusses the radical implications of new ICTs have for conventional teaching and learning. The report predicts the transformation of the teaching-learning process and the way teachers and learners gain access to knowledge and information. It notes that ICTs provide an array of powerful tools that may help in transforming the present isolated, teacher-centred and text-bound classrooms into rich, learner-centred, interactive knowledge environments in educational systems. Schools must incorporate the new technologies in teaching-learning systems to meet the upcoming challenges of the global society.

In the year 2001, the United Nations ICT Task Force was established by the Secretary-General Kofi Annan for the identify ways to harness the potential of ICT for economic and social development. This task force is important for economic growth as it develops a skilled workforce, which increases the overall productivity. It also empowers people to improve their environment, health and governance system. To strengthen the whole education system and communities around the world, Global
e-Schools and Communities Initiative (GeSCI) was established in the year 2004. In this context, Kofi Annan rightly stated that “The Global e-Schools and Communities Initiative matches the power of ICT with educational need, and has the potential not only to improve education, but also to empower people, strengthen governance, open up new markets and galvanize our efforts to achieve Millennium Development Goals.” In partnership with different Governments, the private sector and also civil society, GeSCI designed practical, long-term and sustainable solutions and cultivated the growth of ICT in education environment.

Simultaneously, a holistic ‘Framework for ICTs in Teacher Education’ proposed by the UNESCO in the year 2002. In planning for implementations of ICTs into teacher education programs takes into account the factors like social, educational, cultural, technology resources that are important in planning the integration of technology into pre-service curriculum. The curriculum framework of teacher education is comprised of four clusters of competencies encircled by 4 supportive themes. Name of the 4 themes are Context and Culture, Leadership and Vision, Lifelong Learning and Planning and Management of Change. The above framework further states that each teacher is allowed to interpret the curriculum framework within his/her context and personal approach to pedagogy that is always related to the subject discipline or content area, rather than to the technology itself. The model of the framework illustrates the significant interdependence of the themes and competencies – all themes interacting with all competencies.

2.3.8 ICT in the Indian Perspective

ISI (Indian Statistical Institute) Calcutta was the first to install computer system (HEC-2M) in India in 1958. The first indigenous computer system was
developed by ISI in 1964. During this period (1958-64), India installed 10 computers from IBM Company and 6 from others. During the period 1964-72 around 170 computers were installed and out of which 75 computers were supplied by IBM Company. In this period, the share of the private companies was 45% of the entire market. Since 1990 onwards as the effect of LPG the market picture was completely changed and many corporate sectors entered to the field of IT industry.

The process of introducing advance technologies in the field of school education started in India under the scheme of ‘Educational Technology (ET)’ in the year 1972, during the period of 4th five year plan (1970 – 1974). Under the scheme of ‘ET’, best assistance was made to six SIET (State Institute of Educational Technology) for procurement of radio cum cassette players (i.e. two in one) and televisions. In the year of 1984 – 85, a new initiative called ‘CLASS’ (Computer Literacy and Studies in Schools) was launched as a pilot project with the use of microcomputers from the BBC (British Broadcasting Corporation). The National Policy of Education (NPE) introduced in 1986, is the comprehensive policy framework for the Indian educational development. The Programme of Action (POA) – 1992 on NPE emphasized the need for creation of ‘computer literate environment’ in schools. During the period of 8th five year plan (1993 – 1997), the ‘CLASS’ project was adopted as a centrally sponsored scheme. The scope of the ‘CLASS’ project was elaborated to provide financial grants to new Government and Government aided secondary-higher secondary schools in India. In July 1998, the prime minister of India made significant recommendations for introduction of IT in the school education through the ‘Vidyarthi Computer Scheme’ and ‘Shikshak Computer Scheme’. After some years, India has launched its own educational satellite, Edusat, to promote access to schools and to mitigate the issue of absence of qualified teachers.
Government of India has also launched vital initiatives like, ICT@Schools programme and the Vidya Vahini Project, to train students in the technologies of the new era. Furthermore, India, an active founder member of United Nations ICT Task Force, has been focusing on objectives specified by the Millennium Development Goal (MDG) (Sachs, 2005) of United Nations. Aim has been set to specifically deploy ICTs in seminal areas like education, health care and governance. Brief descriptions of Indian Government’s Initiatives are given below:

a) **National Information Centre (NIC):** NIC was established in 1975 to improve the productivity in the working of the government. The main purposes of NIC were analysis of the organization structure, qualitative studies of planning process, exploring of effective management information system (MIS) for the different ministries and departments of Government of India (GOI) etc. NIC established ‘NICNET’ network system and it was commissioned in 1977. In this time, 200 technical personnel were serving over 40 ministries and departments of the GOI and also their associate organizations. Near about 150 databases had been created for user organizations. A wide network was formed by NICNET.

b) **Regional Computer Centres (RCC):** RCC were established to promote computer education in the country. Two RCC started at the Jadavpur University, Calcutta (1977) and Chandigarh in the year 1979. These two regional computer centres conducted various advanced computer studies, seminars and trainings.

c) **Centre for Development of Advanced Computing (C-DAC):** It is a non-profit Research & Development Institution under Ministry of Communication and Information Technology, Government of India. C-DAC is developing
various electronic products and systems. This institution is generating manpower to supply the up-coming demand for trained manpower. Different institutions such as ACTS (Advanced Computing Training School), PACE (Programme for Advancing Computer Education), NMRC (National Multimedia Resource Centre), C-DAC School of Advanced Computing etc. are working under C-DAC and variety of courses & programmes are offering by such institutions.

d) **Computer Maintenance Corporation (CMC):** CMC is a pioneer institution of India. It was functioning under the Department of Electronics, GOI. It was providing various maintenance supports to computer systems of India. CMC’s service was given on software development, hardware maintenance, consultancy, education & training, system integration and enhancement etc.

e) **AKSHAYA:** AKSHAYA was the first district-wide E-literacy project in India and it was started at first in Malappuram district of Kerala. It has conducted the World’s largest computer literacy drives. AKSHAYA project is going on at present in Kerala and it facilitating the multi use of ICT by all segments of this state. Various benefits of this project are visible everywhere in Kerala state.

f) **Vidya Vahini Project:** The Government of India launched ‘Vidya Vahini Project’ in 2002 to provide for IT and IT-enabled education in 60,000 schools in India over 3 years. It started as pilot project which covering 150 schools the government purposes to equip each school with a computer lab equipped with internet, intranet and television to facilitate video conferencing, web broadcasting and also e-learning.
g) **The National Task Force on Information Technology and Software Development (IT Task Force):** It introduced in July 1998, made specific recommendations starting that computers and the internet should be made accessible to schools, colleges, polytechnics and government hospitals in the country by 2003. ‘IT Task Force’ further recommended for 10 Personal Computers (PCs) with internet connectivity in every school, local language software capabilities and the inclusion of the private initiatives in this area. The Department of School Education released a draft scheme of ICTs in schools in 2004, which called for providing computer-aided education to secondary and higher secondary Government schools in partnership with State Governments and establishments of schools that are technology demonstrators.

h) **Radio and TV Network of India:** India has historical background of ‘All India Radio (AIR)’ channels and the national TV network ‘Doordarshan’. By using both of them, various educational contents broadcasted from very earlier days for different levels of education. Actually radio was the first ICT to be used for education in India. After that the Government of India has proposed a new ‘FM Radio Policy’ for introducing 100 FM Radio Stations across the country. Radio and TV network will undoubtedly create greater access and opportunities for mass education. In the year 2001, **Gyan Vani** was initiated in India and it was operating through FM Radio Stations from different parts of the country. The above Radio network is tried to expand according to its demand. The channel serves as for addressing local educational, developmental and socio-cultural needs through English, Hindi and other regional languages. It is an interactive Educational channel hosting phone-in.
counselling programme offered. Gyan Vani is very popular FM Radio channel in India. **Gyan Darshan** was launched on the 26th January, 2000 in a partnership with the MHRD and IGNOU. It is a fully digital 24 hours exclusive Educational TV channel, which provides a perfect blend of core curriculum based programmes in the areas of primary, secondary, higher, technical & vocational, open and distance education. Gyan Darshan (GD) is worked by 3 channels, GD 1, GD 2 and GD 3. GD 1 is the main channel and it includes the nation-wide classroom programmes. GD 2 is an interactive channel for distance education and GD 3 is made for technical & vocational education.

i) **Information Technology Act (2000):** The **IT Act (2000)** stressed the technical higher education, which would help students gain jobs in IT industry. The ‘Technology Policy 2001’ called for the teaching of science at school and college levels. In India, IT industry has witnessed great success through its varied software programmes and partly hardware works for the upliftment of society in general and industrial growth. Such a growth has brought some inevitable legal problems also. Above growth in the form of cyberspace, e-commerce, various electronic transactions, online education and ODL (Open and Distance Learning) system of education have made it imperative to bring about legal changes in India through the IT Act, 2000. But this ‘IT Act, 2000’ had a number of loopholes and not balanced. Therefore, it was necessary to enact the Information Technology (Amendment) Act, 2008.

j) **The National Telecom Policy:** The ‘**National Telecom Policy - 1999**’ tried to provide potential universal service and also high end services to meet the social, educational and economical requirements of the country. The
Department of Telecommunications Perspective Plan for 1997-2007 and Broadband Policy 2004 did accelerate the importance of ICT in education.

k) **Sarva Shiksha Abhiyan (SSA) and Rashtriya Madhyamik Shiksha Abhiyan (RMSA):** Sarva Shiksha Abhiyan (SSA-2001) is one of the major programmes of GOI for the achievement of Universalization of Elementary Education (UEE), making free and compulsory education to the Indian children of 6 – 14 years age. SSA is being applied in partnership with State Governments in the entire country. SSA has important components for various activities like community computer education especially for upper primary students. One of the important aims of SSA is to create computer literacy and awareness among learners and teachers at the elementary stage. To make teaching-learning effective and interesting through computer aided learning (CAL), to generate digitalized and other forms of supplementary material and to improve the overall quality of the elementary education, SSA is being worked in countrywide. The GOI has taken a new scheme for Universalization of Secondary Education (USE) through the Rashtriya Madhyamik Shiksha Abhiyan (RMSA) in the year of **2008-09.** RMSA has also emphasized on the promotion and incorporation of ICT in secondary education for quality development.

l) **Scheme For Computer Literacy Excellence Awards:** The Department of Information Technology (DIT), Ministry of Communications and Information Technology (MCIT), Government of India, in the year **2002** has introduced an ‘Award Scheme for Excellence in Computer Literacy and Information Technology in Schools at State and National Level’ to create the IT awareness
among schools and also to encourage the computer literacy among students in early stage of schooling.

m) **ICT@Schools**: ‘ICT@Schools’ launched by the Government of India (GOI) in the year of 2004 after merging the erstwhile Schemes of ‘Educational Technology (ET) and Computer Literacy and Studies in Schools (CLASS)’. The scheme is a major catalyst to develop ICT skills of the school students. CIET (Central Institute of Education Technologies), six SIETs (State Institute of Educational Technology) and five RIEs (Regional Institute of Education) are closely attached for the development of e-content. The ‘ICT@Schools’ scheme has been revised in 2010 and ‘Smart Schools’ (i.e. schools highly enriched with ICT facilities) has been recommended on a pilot basis in every state. The ‘Smart Schools Project’ has encouraged and promotes the usage of advance technology in Indian Government schools and also shares the infrastructure & resources with the neighbourhood schools.

n) **Edusat - Education Satellite of India**: Edusat is the 1st Indian (educational) satellite launched by the ISRO (Indian Space Research Organisations) on the 20th September 2004. Edusat is primarily meant for school & college level education, but it supports non-formal education also. Many projects have been aligned to impart education through Edusat, like as ‘Virtual Classroom Technology on EDUSAT for Rural Schools (VICTERS) programme. Edusat has the following major objectives:

i. To provide a ‘Sustainable Distance Education Service’ in India;

ii. To Support the formal and non-formal education of India;

iii. To bring a knowledge revolution in the every field of Indian education in the upcoming years.
o) **Sakshat Portal:** Sakshat Portal of MHRD (Ministry of Human Resource Development) was launched by the President of India in **October, 2006.** It is a single window portal for ‘One Stop Solution to Education-Online’ of students, teachers and lifelong learners. The content of the portal is getting added through collaborative efforts of renowned experts of the country in different subject fields and they have been freely contributing their wisdom to this portal. The Sakshat Portal already contains the four quadrant approach to learning which includes written course material, simulations, animations, video lectures, question answers, related web links, confidence building measures and others. One of the important features of the Portal was an interactive system, wherein learners would be able to interact with the teachers to clarify their doubts. The above portal also tried to reach even those who are illiterate or dropouts or in need of life skills, a module of digital literacy has been prepared which tells everything about computers and other relevant knowledge. Digital literacy Module has been prepared and would be circulated through CDs, telecasts or other means of communication apart from making it available on Sakshat for users to download and freely use it by the masses. The Sakshat would also be branching out to various effective packages such as data base of soil conservation, geographical information systems (GIS), robotics etc. There is a great scope for every Indian to liberally contribute their wisdom or expertise with all stakeholders so as to enable all of them to put proper knowledge and understanding for creating knowledge based society.

p) **National Mission on Education through ICT (NME-ICT):** It was launched for the ICT enhancing in teaching-learning system of education. The ‘National Knowledge Network’ through the high-speed digital broadband system is
served for inter-relating the major educational and research institutions, colleges and Universities. The NME-ICT is related with content building, access enabling and also developing low cost ICT tools & devices. ‘Aakash Tablet’ is already launched in 2011 for Indian students to create the ICT literacy. The NME-ICT is prepared a number of different items for content creation compatible with Aakash Tablet.

q) **Various Collaborative Activities:**

- **ERNET India:** ‘Vidya Vahini’ is a special vehicle on ICT based education in schools as a pilot project, initiated in 2003 for countrywide internet backbone for education and research purposes. It has some special objectives, such as to enable the schools to form their own intranet and facilitate information exchange; to enable every one of students to interact cum exchange of information with other students of different parts in India;

- Under a MOU with Central Government, **Intel** is providing training to all the teachers of participating schools in ‘Technology Aided Learning’. Intel has also designed the study materials in different regional languages to train the schools teachers.

- **Shiksha Project:** Microsoft, in collaboration with Central Government, is tried to accelerate computer literacy for teachers and students across government schools. Microsoft has already established an efficient team to focus on delivering Project Shiksha and has taken a comprehensive program that offers IT curriculum development, effective training for teachers &
students, various software solutions and scholarships for teachers and students of India.

- **Media Lab Asia**: It was set up by Central Government as a not-for-profit organization with a vision of leveraging the ICTs and other advanced technologies for the benefit of the common people. Media Lab Asia works with academic and research & development institutions, industry, NGOs and State & local Governments. Several research, development and deployment projects have been taken up by Media Lab Asia. Its application development is focused on the use of ICT for education, healthcare and livelihood generation, empowerment of the disabled persons and also providing rural connectivity. The research areas of Media Lab Asia are advance technologies for broadband rural connectivity, affordable computing & access devices and also modern interfaces. One of the important projects of Media Lab Asia is ‘ICT for Education Multimodal Participatory tutoring system for the Rural Children’. In the period of 2006-07, IIT-Bombay (a research hubs of Media Lab Asia) has conducted a faculty development program to train the teachers, develop courseware websites to help knowledge transfer, and ITS (intelligent tutoring system) to adapt itself according to the requirements of the learners.

r) **Some State Governments Initiatives**: In addition to these central and collaborative activities, some State Governments have their own initiatives for ICT in education. Some examples are given below:

- **Chalta-Phirta Mobile Bus**: This bus is to go around the slum clusters of New Delhi. It is fitted with a TV screen and equipped with computers, multimedia facilities, a student-book library, blackboard
and toys. Every bus has 2 trained teachers to educate the slum children through books, toys, computers, films etc.

- **Eklavya**: Eklavya is a computer aided self-learning initiative by Chhattishgarh State Government to provide fully animated multimedia software based on VI to VIII levels textbooks. Touch screen computers are placed in the school corridors for easy access by learners.

- **ICT enabled Teaching in Rural Schools**: The main objectives of this project are to apply ICT in classroom teaching on a pilot basis in the selected schools of Karnataka and also to evaluate the effectiveness of ICT for improving the quality of classroom teaching. The teachers of 15 rural schools were properly trained in ICT based teaching for science subjects. The above project has been undertaken in collaboration with SSA.

s) **Private Sectors Initiatives**: Some private sectors have also taken initiatives for ICT in education. Microsoft, Intel, IBM have already initiated programs of teachers training in different states of India. Wipro, Educomp, Bhartiayvidya have prepared several educational content for learners. More other examples are given below:

- **National Centre for Software Development and Computing Techniques (NCSDCT)**: It was set up at the Tata Institute of Fundamental Research (TIFR), Mumbai in the year 1974. It was a major private initiative of India. The main aims of NCSDCT were the development of software tools and computing techniques. The major
areas of operation were software engineering, computer networking and computer-aided design (CAD).

- **Intel:** Intel started ‘Computer Literacy and Training Programme’ (CLTP) to encourage computer literacy in school education. The West Bengal Government proposed the scheme in 2002 and implemented it in 500 schools by early 2005. Intel further started ‘Intel Teach’ programme for capacity building of teachers. Intel® Teach to the Future professional development introduces pedagogically-sound instructional design in technology-supported units. It was initiated in West Bengal in 2004 and extended with the Madrassa Board in 2005. More about 6168 school teachers of West Bengal were trained basic ICT skills under ‘Intel Teach’ programme.

- **Ajin Premji Foundation:** This institution was served the effective experience of ‘Computer Aided Learning’ (CAL) in rural elementary schools.

- **IETS:** IETS manufactured an innovative community computer – ‘KYAN’ in collaboration with IIT (Mumbai). It is designed in 2004 and launched in 2007. KYAN contains a computer with inbuilt projector, content, speakers, wireless keyboard and mouse. The content of KYAN consists of 1090 lessons on various topics in all subjects from class I to X. Recently the lessons are translated in Bengali and Urdu. A pilot initiative was undertaken in 2007 – 08 in 65 Government schools of Burdwan and Bankura districts of West Bengal. The initiative covered 500 teachers and 40,000 students, mostly of SC &
ST students. The KYAN initiative also covered in the several districts of West Bengal, like as North 24 Parganas, South 24 Parganas, Howrah, Purulia, Malda, Nadia and Cooch Behar.

- **NIIT@Schools Project:** NIIT was working on ICT programme in different states of India since 2001. They launched ‘NIIT@Schools’ project for computer education of schools.

- **Webel-IBM Partnership Programme:** Webel-IBM partnership programme launched in West Bengal in 2002, under the name ‘IBM-Integrated IT Literacy Programme. They showed remarkable results in computer education in schools of West Bengal.

- **Integrated approach Technology in Education (ITE) Project:** Sir Dorabji Tata Education Trust (2013) has introduced a 3 years pilot project of the ‘Integrated approach Technology in Education’ (ITE) in Kandi subdivision of Murshidabad district in 2012. The project is implemented for the adolescents students in rural areas of Kandi subdivision.

2.3.9 Views of Different Indian Committees, Commissions, Policies and Plans regarding Integration of Advance Technology (IT, ICT etc.)

**The Scientific Policy Resolution (1958):** It emphasized on importance of technology as “The key to national prosperity, apart from the spirit of the people, lies in the modern age in the effective combination of three factors, technology, raw material and capital of which the first is perhaps the most important, since the creation of the most new scientific techniques can in fact make up for a deficiency in natural
resources and reduce the demand of capital”. Also it is farther commented that the wealth and prosperity of a nation depends on the effective utilization of its human and material resources through industrialization. The use of human material for industrialization demands its education in science and training in technical skills. Industries open up possibility of greater fulfilment for the individual. India’s enormous resources of manpower can only become an asset in the modern world when trained and educated.

**The Technology Policy Statement (1983):** It stated “Our directives must clearly define systems for the choices of technology, taking into account economic, social and cultural factors along with technical consideration; indigenous development and support to technology and utilization of such technology through import and its subsequent absorption adaptation and up-gradation; ensuring competitiveness at international level in all necessary areas; and establishment links between the various elements concerned with generations of technology, its transformation into economically utilizable form the sector responsible for production, financial institutions concerned with the resources needed for these activities and the promotional and regulating arms of the government. Our own immediate needs in India are the attainments of technological self-reliance, a swift and tangible improvement in the conditions of the weakest section of the population and the speedy development of backward regions. Technology must suit local needs and to make impact on our lives of ordinary citizens must give constant thought to even small improvement which could make better and more cost effective use of existing materials and methods of work.
**National Policy of Education (1986):** The NPE (1986), as modified in 1992, emphasized the need to employ educational technology to improve the quality of education in different levels. The policy statement led to 2 major centrally sponsored schemes, viz., Educational Technology (ET) and Computer Literacy and Studies in Schools (CLASS) paving the way for a more implementation of advance technologies in education. The original policy of ‘NPE - 1986’ did not specifically mention the use of ICTs in school education. But the NPE (1986) was prepared an expand programme of the earlier CLASS (Computer Literacy and Studies in Schools) pilot project in the period of 1987-88 to cover 13000 higher secondary schools all over the country. The Programme of Action (POA) – 1992 on NPE emphasized the need to improve the access to computers in schools. During the period of 8th five year plan (1993 – 1997), the ‘CLASS’ project was adopted as a centrally sponsored scheme and the scope of the ‘CLASS’ project was elaborated to provide financial grants to new Government and Government aided secondary-higher secondary schools in India. Actually, the POA (1992) tried to create a ‘computer literate environment’ in Indian schools. A developed programme of computer literacy was organized in a wide range from the elementary stage of school education. It was a comprehensive policy framework for the Indian educational development.

**Curriculum Framework For Quality Teacher Education (1998):** In 15th August of 1998, National Council For Teacher Education (NCTE) published his first curriculum framework on teacher education, entitled ‘Curriculum Framework For Quality Teacher Education’. In this curriculum framework, NCTE expressed his qualitative views towards Indian teacher education as “Teachers are the torch bearers in creating social cohesion, national integration and a learning society. They not only disseminate knowledge but also create and generate new knowledge. They are
responsible for acculturating the role of education. No nation can even marginally slacken its effort in giving necessary professional inputs to its teachers and alongwith that due status to their stature and profession.” This curriculum framework realised that “the changing context of globalisation, liberalisation and advances in telecommunication, teachers and teacher educators need to become conversant with internationals trend, internationalism, multiculturalism, multi-racialism and other pluralities. Both pre-service and in-service teacher education programmes should be receptive to new thinking and new changes.” Based on the above realizations, the curriculum framework strongly stated that in-service teacher education programme must be ‘initiates and orients teachers to new roles (of them) and technologies’.

The National Curriculum Framework for School Education (2000): The NCFSE (2000) wanted to meet the increasing challenges of ICT i.e. all innovations in the areas of media production and the interactive video and multi-media computer software shall have to be perceived as important and integral components of the curriculum development process in school education. The NCFSE (2000) rightly predicts that “The ICT is bound to influence and transform the existing educational provisions, changing the existing curricula, bringing in a new generation of learning materials and encouraging the networking of schools. Integration of ICT into schooling would demand that the educational planners look beyond the current urban classrooms devising updated plans for education in an electronic environment even in the far-flung rural areas and expanding their design so that the computer becomes more than a subject of study. It is not merely integrated into an existing curriculum; it becomes, instead, an integral part of the schooling process resulting in universal computer literacy, computer aided learning and finally, computer-based learning throughout the country. All innovative experiments in the areas of media production
and the interactive disc and video and multimedia computer software shall have to be perceived as integral components of the curriculum development process rather than to it. It would necessitate the teachers’ adopting an instructional design that helps the learner master heuristic and algorithmic strategies for tackling new problems as opposed to strategies aiming at the mastery of discrete units of some fixed knowledge.” The NCFSE (2000) envisages a “shift from the traditional learning atmosphere to a climate of values that encourages exploration, problem-solving and decision-making and from the prescriptive classroom teaching to participatory, decentralised interactive group learning.” This curriculum framework further suggests that “only discrete healthy and healthful use of it in the classroom and outside is made . . . negative factors like its addiction, its use for uneducational and miseducational purposes” be prevented carefully.

**Report of The School Education Committee West Bengal (2002):** The School Education Committee West Bengal has given views on ‘Computer Education’ through the following several recommendations.

- Computer Literacy Programme may be organised outside the School Education system at resource centres to be tagged to school clusters without charging any fees from the students.

- Information Technology encompasses theory and practice of a number of technologies including computers, which are used to create, store and disseminate information. Therefore, implementation of any programme at school level must be preceded proper designing of the management of the system particularly with emphasis on academic needs of students for both I.T. education and I.T. enabled education.
• Teaching of Computer Applications as optional subject in classes IX and X and also as elective subject at the H.S. level should be strengthened. No business concern should be involved in this process.

• Care must be taken to ensure that computer education under the auspices of the Government or the Statutory Authorities does not create any divide on the basis of economic or social condition of the pupils. Priority in this matter must always go to the less privileged students of the state.

The report of ‘The School Education Committee West Bengal’ was submitted on 31st December 2002 and it was published by the Department of School Education, Government of West Bengal. This report helped to employ the computer education to improve the quality of school education in West Bengal.

10th Five year Plan (2002 – 2007): It emphasized on the importance of ICT in education and a need to remote its use in education as follows: “This will include the reworked centrally sponsored schemes Computer Education and Literacy in School and Educational Technology which seek to familiarize students with IT. Keeping in view the current demand for IT, a major thrust is to be given to this scheme. State Government would prepare computer Education Plans for computer literacy and education. The components of the merger schemes ICT in school would include (a) Funding support for CEP; (b) Strengthening and reorientation of the staff of the State Institute of Education and Training ; (c) Digitalization of SIET’s video and audio cassettes in partnership with NGO ; (d) Web/internet based education to be managed by the SIEts”. Furthermore, the Working Group on Elementary and Adult Education
for the **10th Five Year Plan (2003 – 07)** recommended that initially one or two
schools in every cluster in the country should have facilities for computer based
learning, which can be used by learners in adjoining schools.

**Science and Technology Policy (2003):** It commented that “science and
technology have had unprecedented impact on economic growth and social
development. Knowledge has become a source of economic might and power. This
has led to increase restrictions on sharing of knowledge, to new norms of Intellectual
Property rights, and to Global Trade and technology control regimes. Scientific and
technical developments today also have deep esthetical, legal, social implications.
There are deep concerns in society about these. The on growing Globalization and
intensely competitive environment have a significant impact on the production and
service sectors.”

The policy further said that “A major initiative to modernize the infrastructure
or science and engineering in academic institutions is to be undertaken. It will be
ensured that all middle and high schools, vocational and other colleges will have
appropriately sized science laboratories. Science, engineering and medical
departments in academic instructions and universities and colleges will be selected for
special support to raise the standard of teaching and research. To begin with, a
significant number of academic institutions, specially the universities, as also
engineering and medical institutions, would be selected for this support to make an
impact. Flexible mechanisms for induction of new faculty in key areas of science
would be developed. Constancy of support and attention will be ensured over at least
a ten year period.”
Curriculum Framework for Teacher Education (2004): In January 2004, NCERT published the ‘Curriculum Framework for Teacher Education’ as a contribution for teachers’ personal and professional development. NCERT rightly perceived in this curriculum framework that “ICT is gradually emerging as an integral part of the schooling process. It influences not only the teaching style but also the learning style. ICT results in transformation from teacher-oriented learning to that of exploratory self-learning.” Based on the above perception, the curriculum framework suggested that “Teachers need to complement their content and pedagogy expertises by utilising online facilities. Use of ICT effectively requires a change in classroom practice rather than mere acquisition of technical skills. Teachers need to familiarise themselves with possibilities, approaches and applications in the use of ICT that facilitate teaching-learning. These technologies along with overhead and computer projections have to potential to make teaching, learning and training processes more efficient and cost effective. It has opened up new possibilities of reaching out to the still unreached – disadvantaged groups and children with special needs. . . . Teacher education programmes at the pre-service and in-service levels must have ample scope for inducting pedagogic skills and management of technologies as important components of teaching-learning environment to enhance efficiency of transaction.”

The Curriculum Framework for Teacher Education (2004) also hoped that “Teacher educators have to develop new understanding, approaches and attitudes in harmony with new developments in information technology. Their proficiency in these areas would help them train student teachers effectively. Teacher education institutions have to take leadership in using information technology.”

National Curriculum Framework (2005): NCF (2005) presents a positive vision and a new discourse on key contemporary educational issues. Executive
Summary of ‘National Focus Groups Position Papers (2008)’ states that “Information and Communication Technology (ICT) is also an important tool for bridging the social divides. ICT should be used in such a way that it becomes an opportunity equaliser, by providing information, communication and computing resource in remote areas”. NCF (2005) defines the proper ways that can be taken to empower individual teachers who can then empower learners. This framework says that “Information and Communication Technologies (ICTs) have brought in a convergence of the media along with the possibility of multi-centric participation in the content-generation and disseminative process. This has implications not only for the quality of the interchange but also for drastic upheavals of centre-dominated mindsets that have inhibited qualitative improvement”. NCF (2005) emphasizes on the systematic reforms through creates an ICT-rich environments in all the schools. The education of the school teachers not only facilitates improvement of school education by preparing professionally competent teachers, but also functions as a bridge between schooling and higher education.

National Knowledge Commission - 2006: NKC (2006) tried to enhance the quality of ICT infrastructure. It expressed a deep concern to develop a knowledge network among educational institutions to disseminate knowledge from online resources. According to its views, websites and web-based services would improve transparency and accountability. A portal on higher education and research would increase interaction and accessibility. In this context NKC (2006) emphasizes on “a national knowledge network interconnection all universities, all technical institutions, all medical institutions, all agricultural institutions, all related R & D institutions, all libraries and all universities with an access network providing up to 100 Mbps
connectivity for optimal utilizations of resources to give a major push to research and spread of quality education, is required and is entirely feasible.”

**11th Five year Plan (2007 – 2012):** A number of major steps have been taken for the effective use of ICT in school and higher education. In the field of school education, technology up-gradation includes ICT in schools and technical assistance (TA) includes the educationally fragile States. IT could provide new directions in pedagogical practices, students’ achievement and also initiating web-based learning through modern software facilities. Eleventh Plan Targeted for Universal coverage of ICT at the level of elementary education by 2011–12. NLM revamped their strategy for literacy: ‘ICTs will be more widely used to spread literacy in the country’. An amount of Rs 5000 crore is being provided during the Eleventh Plan for providing ICT infrastructure in Government and Government-aided secondary and senior secondary schools. There are about 1.4 lakh such schools out of which 1.08 lakh are government and government-aided schools and about 28000 schools are in far flung areas. About 80000 schools are proposed to be connected on Internet through terrestrial/wireless broadband mode and the remaining 28000 schools will be provided Internet connectivity through broadband Very Small Aperture Terminals. For proper use of ICT in school education, 11th five year plan, vol. iii (Commission, 2008) stated that “IT in School Education Technology could be effectively used for digital delivery of high quality lectures and course material to other institutions and embellish the same with class room teaching for enhancing the learning. ICT tools can make it easier to monitor not only the attendance and performance of the students but also that of the teachers as well. The MIS also needs to be developed to monitor national projects such as SSA, MDM, ICDS, etc.”
Several steps have been taken for the multi use of ICT in higher education. UGC INFONET allows teachers and students to have access to e-formatted journals. The network is run and managed by ERNET India. Information for Library Network (INFLIBNET) and UGC are the nodal agency for coordination and facilitation of the linkage between ERNET and Universities. States have also agreed to encourage their Universities, colleges, and technical institutes to become members of INFLIBNET and Indian National Digital Library for Engineering Sciences and Technology (INDEST). During the period of 11th Plan, National Mission in Education through ICT launched to increase ICT coverage in all the Universities and many colleges. The Mission tried for digitization and networking of all educational institutions, developing low cost and low power consuming access devices, and making available bandwidth for educational purposes. During the 11th Plan, the ‘National Knowledge Network’ tried to create a standard ambience by establishing a dynamically configurable national multi-gigabit network connecting all major educational institutions, research & development institutions, hospitals, libraries, or agricultural institutions.

**National Curriculum Framework for Teacher Education (2009):** NCFTE (2009) understands that “the onset and proliferation of Information and Communication Technology (ICT), there is a growing demand that it be included in school education.” Thus the framework envisages that “Teacher education needs to orient and sensitize the teacher to distinguish between critically useful, developmentally appropriate and the detrimental use of ICT. In a way, ICT can be imaginative drawn upon for professional development and academic support of the pre-service and in-service teachers”. NCFTE (2009) suggests proper ‘Use of Distance Media’ in respect of continuing professional development and support for in-service
teachers. It clearly stated that “ICT including TV, radio, telephony and internet are useful as resource and providing access to ideas or for the wider dissemination of information. Distance media can be effectively used to keep teachers in touch with other professionals in the field and to give access to professionals in education as well as in pure academic disciplines . . .” NCFTE (2009) also recommends on the professional development of teacher educators through the specific use of ICT.


After the views of NCTE (2011) on “Demand and Supply Estimates of Intake Capacity of Teacher Education Courses across the States and Union Territories (2009-10 to 2016-17)”, the Supreme Court of India set up Justice Verma Commission (JVC) in 2012 to review the entire teacher education system of India and functions of NCTE. Beside that the recognition of D.Ed. colleges in bulk manner in already over supplied state of Maharashtra and the continuous effect of privatization in education in almost last decade were the immediate causes for setting up of the JVC (2012). The JVC Report (2012) delivered significant recommendations in order to regain the minimum standards in teacher education of India. NCTE (2013) prepared a “Plan of Action of Justice Verma Commission Report”. Some of the important ‘Plan of Action (2013)’ given below:

- Multi and inter-disciplinary approaches to be started in teacher education;
- Teacher education programmes should be redesigned according to NCFTE 2009;
- A broad-based qualification of teacher educators need to be developed by NCTE;
- Faculty development programmes must be institutionalized through UGC-Academic Staff College;
• In-service teacher education institutions DIETs, SCERTs, BRCs, CRCs, etc. need to be strengthened for elementary teacher education.

• Continuous professional development programmes for secondary school teachers are needed in arrangement with CTEs, IASEs, and University Department of Education;

**National Policy on ICT in School Education (2012):** A successful integration of ICT into teacher education programme is the only way to which the teacher educators have the proper knowledge, attitude and skills in ICT promotion. A well balanced and sustained programme of professional development is required for the teacher educators and school teachers to develop their ICT knowledge and skills. There is a great need to development and revision of existing pre-service and in-service teacher education programme. In order to meet the above needs and related questions which can be suggested for the formulation of the Indian National Policy on ICT in School Education, Global eSchools and Communities Initiative (GeSCI) alongwith Centre for Science, Development and Media Studies (CSDMS) as a core facilitating partner organised a ‘National Level Round Table Discussion and Consultation on Capacity Building of Schools and Teachers in ICT’ under the supervision of MHRD, Government of India, in New Delhi on 30<sup>th</sup> September, 2008. Department of School Education and Literacy Ministry of Human Resource Development Government of India published a ‘Revised Draft’ (dated 24.02.2011) and also a latest revision (dated 23.03.2012) on the ‘National Policy on Information and Communication Technology (ICT) In School Education’ (NPICTSE). Vision of this policy is “preparing youth to participate creatively in the establishment, sustenance and growth of a knowledge society leading to all round socioeconomic development of the nation and global competitiveness.” The ICT Policy in School Education will endeavour to create the
“development of professional networks of teachers, resource persons and schools to catalyse and support resource sharing, upgradation, and continuing education of teachers; guidance, counselling and academic support to students; and resource sharing, management and networking of school managers and administrators, resulting in improved efficiencies in the schooling process.” In this policy, various concern areas such as ICT in school education, ICT for school management, ICT infrastructure, digital resources, capacity building, implementing and managing the policy etc, were well discussed.

**Rashtriya Uchchatar Shiksha Abhiyan (RUSA 2013):** The latest ‘RUSA 2013’ aimed at achieving 30% in higher education by the year 2020 have indeed given a conspicuous reason for an urgent call on revisiting the past glory of teacher education. Especially RUSA (2013) will include the establishment of improvement in usage of ICT for leveraging learning efforts. It suggests that “ICT content development be made compulsory at the State University level. The research scholars should be motivated to opt for innovative inter disciplinary research to take advantage of the convergence of technologies. . . . Centres of Excellence in Research and Development will be created in at least 10 important and specific areas chosen by an expert committee. Joint ventures and Memoranda of Understanding with world class universities and premier institutions across the world would be encouraged.”

**12th Five year Plan (2012 – 2017):** During the 12th Plan a programme for ICT in elementary schools will replace the erstwhile Computer-Aided Learning (CAL) under SSA. There would include provision of networked computers, accessories and an Internet connection in a phased manner. A variety of software tools and pedagogically appropriate e-content in local languages will be developed for school curriculum. ICT
should be used to network teachers and schools in a specific geography – this would enhance collaborative teaching and learning. One of the important elements of the 12th Plan’s objectives is to achieve ICT integration in education. Quality initiatives for ICT integration, taken up by CBSE should be promoted as national programmes. CBSE are producing quality-assured digital content in local language and encouraging teachers to create their own content and upload on a common web portal, provisioning affordable ICT facilities in classrooms, ICT-integrated education supported by LMS. During the Twelfth Plan, RMSA will be made ICT integration in education for address the issues of coverage and quality in secondary education. ICT@Schools will be integrated with RMSA to provide greater flexibility, enable optimal utilisation of resources and yield better results. The National Policy of ICT in School Education envisions and provides for the development of a holistic framework of ICT support in the school system. Mission Mode Project (MMP) on School Education is now under the National e-Governance Plan (NeGP). This would enable comprehensive technology enablement of the school education sector. This would cover: Developing ICT skills of all heads of schools, teachers, non-teaching staff and students; Training & encouraging teachers to develop & use e-content and creating provisions for ICT in classrooms and implement ICT-integrated education; Creating a effective digital contents in English, Hindi and regional languages in all subjects, especially in science and mathematics; Enabling provision of ICT-integrated examination at the different institutional and systemic level. The MMP further envisions extensive use of technology to ensure delivery of services to students, teachers, autonomous institutions and partners on an ‘anytime-anywhere’ basis by leveraging the Common Service Centres (CSC) established up to the village level across the country.
At the Gram Panchayat level and at the different equivalent levels in the urban areas, the existing well equipped ICT-enabled multi-purpose Adult Education and Skill Development Centres (AESDCs) would be strengthened to offer a range of adult learning and education programmes to meet local needs of the adults. The National Mission on Education through Information and Communication Technologies (NME-ICT) was launched during the Eleventh Plan. During the Twelfth Plan various initiatives of the Eleventh Plan would be carried forward with an objective to make these programmes more effective, efficient and sustainable. These include digital Infrastructure Initiatives, content Initiatives and Governance Initiatives. During the 12th Plan, a distance-cum-regular teacher education programmes, increased use of ICT in regular basis. NCTE would be strengthened ICT based teacher education curriculum.

2.3.10 Views of Different Indian National Monitoring Institutions for Application of ICT in Teacher Education

NCERT, NCTE and NAAC have emphasized on implementation of ICT for Teacher Education Program. A short description of them is given below:

- **Initiatives taken by NCERT:** NCERT has already prepared the blue prints of ‘Teacher Education Curriculum Framework’ at different levels in collaboration with NCTE. This body is taken various initiatives for Integrating ICT in curriculum transaction and prepared various ICT tools and ICT based learning resources and materials. NCERT has organized regular short time orientation programs for teacher educators and resource persons across the country on ICT based curricula and others. Different exclusive programs are organized for faculty belonging to SC / ST and also for the faculty from Northeast. Furthermore, NCERT has continued the programme of designing
and developing educational multimedia software and instructional materials on e-learning for effective teaching learning process.

- **Initiatives taken by NCTE:** NCTE has taken various initiatives for inclusiveness in ‘Indian Teacher Education Program’. NCTE has already developed different mechanism for both pre-service and in-service teacher education programs. This autonomous body has already signed the MOU with INTEL, in 2006 to achieving objectives of influencing sustainable professional development to all teacher educators from the major institutions and making ICT an integral part of Indian Teacher Education Curriculum. According to views of NCTE old ‘Norms and Standard’ of B.Ed. degree (2009) that “Generally the scope of ICT tools are Receive Only Terminal (R.O.T), Satellite Interlinking Terminal (S.I.T), Internet, E-mail, Chat, Online Database, Software for Pedagogical analysis, Online Evaluation and Mock Test, Voice and Video Conferencing, Computer Assisted Instruction (C.A.I.), Computer Based Training (C.B.T.), Digital Library, Multimedia etc”. ICT is an integral part of the B.Ed. curriculum according to the present ‘Norms and Standards’ of NCTE (2014) for B.Ed. degree. It wants “A course on critical understanding of ICTs shall be offered as an important curricular resource, according primary to the role of the teacher, ensuring public ownership of digital resources, and promoting constructivist approaches that privilege anticipation and co-creation over mere access to ICTs.” Present ‘Norms and Standards’ of NCTE (2014) also suggest an ‘ICT Resource Centre’ (ICTRS) as necessary infrastructure for every secondary level teacher education institution. “There (i.e. ITRS) shall be ICT facilities with hardware
and software including computers, internet, TV, Camera, ICT equipment like ROT (Receive Only Terminal), SIT (Satellite Interlinking Terminal) etc.”

- **Initiatives taken by National Assessment and Accreditation Council (NAAC):** In the system of evaluating gradation of educational institution, NAAC has emphasized on proper implementation and utilization of ICT tools in teaching-learning process. NAAC is regularly demanding from the educational institutions to create the systematic integration of ICT into education. Rather, performance indicators should be developed in order to regular monitor outcomes of ICT usage and integration in the every stage of educational processes.

### 2.3.11 Various Barriers and Present Challenges of ICT in Teacher Education

It is well known to all of us that UNESCO is giving the highest priority to use and integration of ICT in education sectors for more equitable and pluralistic development of global society. Here lies the responsibility of teaching community to answer the related questions on which UNESCO focuses are:

- How can one use ICT to accelerate progress towards education for all and throughout life?
- How can ICT bring about a better balance between equity and excellence in education?
- How can ICT help reconcile universality and local specificity of knowledge?
- How can education prepare individuals and society to benefit from ICT that increasingly permeate all realms of life?

Several points come out from the human mind to meet these specific questions. According to Vallikkad (2009), “First, ICT are only a part of a continuum
of technologies, starting with chalk and books, all of which can support and enrich learning. Second, ICT, as any tools, must be considered as such, and used and adapted to serve educational goals. Third, many ethical and legal issues intervene in the widespread use of ICT in education, such as ownership of knowledge, the increasing exchange of education as a commodity, and globalization of education in relation to cultural diversity.”

❖ **Present Challenges of ICT Integration and Deployment in Education**

i. **Professional Challenges of Capacity Building:** Capacity building on ICT competence of pre and in service teachers are one of the highest challenges in the scenario of global education. There is already a paradigm shift from teaching to learning. Today advanced technology has changed the traditional role of teaching communities. But teachers are not more concerned about ICT revolution and their present responsibilities. Thus the present education system would be more productive only when all teachers are interested and capable of using ICT.

ii. **Infrastructural and Funding Challenges:** Investment in ICT infrastructure is one of the major challenges in education today. Most of the ICT tools are expensive and requires maximum Government funding. But investment in advanced technology always depends on the awareness and attitude of political leadership. It is the fact that the national policy reforms and educational reforms are preconditions for major investment in education.

iii. **Challenges of Appropriate Content in Curriculum:** There is a need to develop appropriate content which will support learning & teaching and maintain relevant education content, keeping in mind positive values &
culture. Appropriate content is one of the important components for any type curriculum.

iv. **Challenges of Appropriate Language:** There is a great need for content-development in regional languages, as well as in easy English. The maximum Indian students are more comfortable in his/her mother language. It is already established that language plays an important role in ICT based group learning of students.

v. **Challenges of Appropriate Approaches:** Every ICT policy needs to adopt a holistic approach to address the curriculum, assessment, instruction, socio-political environment of schools, ICT integration and inter cum cross disciplinary thought procedures. There are still requirements for suitable approaches to explore ICT in education system.

vi. **Challenges of Monitoring of Quality Teaching and Learning:** There is another important challenge to develop advance monitoring system for quality education. To meet this challenge, quality benchmarks in technology usage need to be developed in the various areas of education. Careful attention may be given on different technology products used in education, software and hardware used in educational institution, teachers’ capacity building programmes and also on learning outcomes.

vii. **Challenges of Appropriate Technical Support:** Lack of appropriate technical support is found to be a major challenge for us. Different types of technical problems such as malfunctioning of computers & projectors, less supply of electricity, poor internet connections etc., hamper the teaching-learning activities.
viii. **Challenges against Lack of Confidence, Resistance and Negative Attitude:** Dawes (2001) stated that the ‘lack of confidence’ prevents the teachers to using ICT in their teaching works. Actually, they are not confident in integrating ICT into pedagogical practices. Resistance and negative attitude to use ICT has been observed in some teachers. According to BECTA (2004), “Many teachers lacked the knowledge and skills to use computers and were not enthusiastic about the changes and integration of supplementary learning which associates computers into their teaching practices.” Lack of confidence, resistance and negative attitude to use ICT are visible in the behaviour of many teachers.

ix. **Challenges of Maintaining of ICT Ethics:** ICT is an important instrument of all humans for the gathering of new information and knowledge and it should be guaranteed as a common right to all human beings. All over the Globe, above rights that are already legally recognised, are daily being violated, whether in the name of economic development, political stability, religious reasons, against terrorism movement, or for personal interests. It creates new problems in human social systems, such as the digital divide, digital security, cybercrime and privacy concerns. All of these have affected the people’s lives directly or indirectly. It is crucial challenge to all of us to maintain the principles of ICT ethics in every concern areas. Actually ICT ethics is based on the principles of democracy and the rules of cyber law. They are depending on the universal values of human dignity, freedom, equality and solidarity. We shall be more careful about ICT integration in education, formulation of ICT policies and logical-justified actions taken leading to ICT
outcomes. We always carefully consider that ICT protects human cultures and values, rather than doing damage to them.

### 2.3.12 Some Limitations of ICT Use in Teacher Education

There are some limitations of ICT use in the areas of teacher education, particularly in India. The limitations can be categorized as teacher related, learner related, and advance technology related. The issues like Cost, Training, Distractions, Reliability Damage, Safety, Hacking and lack of Resources potentially limit the benefits of ICT to education (Tiwari, 2014). The main limitations of ICT are given below:

- **High Expensive for Investment and Maintenance:** The initial investment cost for software and hardware application in any institution are very expensive. Even ICT based teaching-learning materials (TLM) are not cost effective. In other side, the maintenance costs of ICT equipments are also expensive.

- **Language:** Most of the information available on the ‘world wide web’ is in English. It is an important limitation for any education system.

- **Teacher-Student Relations:** More applications of ICT tools in teaching-learning process can affect on the natural relations between teacher and student. As a communication tool, ICT decrease the face to face conversation and increase the transactional distance between teacher and student.

- **Digital Divide:** ICT may create a digital divide among learners in classroom set up. The students who are more techno-savvy, they learn faster than others.

- **Plagiarism:** According to Tiwari (2014), “The potential of plagiarism is high as student can copy information rather than learning and developing their own
skills.” High plagiarism is a significant disadvantage for the advancement in research and development of teacher education.

- **Virtual Reality:** High usage of ICT based virtual reality through internet, computer games, cartoons, films etc. can seriously affect the psycho-social dimensions of human society. It may create various mental disorder and social crime.

- **Social Networks:** Various social networks like orkut, face book, twitter, blogs etc. can create different type social problems like gang rape, racism, fundamentalism, communal riots etc. There is great need for proper uses of the social networks side.

**ICT related Bad Practices:** Various ICT related bad practices are visible in the web world, like as computer viruses, hacking, safety & reliability damage, password breaking, cyber crime and many other distractions.