Chapter 2

THEORETICAL OVERVIEW

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Electronic Media Based Instruction

The media resource have active role to play in the transfer of knowledge and in the provision of different types of motivation to the learner often they are not selected just for instructional use purely to stimulate learners’ interest and motivate them to learn, but as structured, integral approach to instruction. This was the part the reason why the period 1945-65 saw major changes in the field of education the world over. Sackett (1968) in his book ‘A history of Instructional technology’ specially observed that there was increasing desire to improve teaching at all levels during the period.

A fundamental component of the systematic approach to teaching learning is the selection of instructional media. The basic rule for media selection is a medium of instruction must be selected on the basis of its potential for implementing a stated objective. A medium, broadly conceived, is any person, material or event that establishes conditions, which enable the learner to acquire knowledge, skill, and attitudes. In the context of this study, media is defined as “the graphic, photographic,
electronic or mechanical means for arresting, processing and reconstituting visual and verbal information (Kumar, 1996).

Both education and instruction deals with acquisition and transfer of information. Technology facilitates and promotes this process. It guides and supports both the sender and receiver. In achieving the selected instructional objectives, the instructor needs to cope with the three Ms- Message, Medium and Method of instruction.

**Message:** The message is usually subject matter content, but it may be direction to the learners, question about the content, feedback on the appropriateness of responses, or other information.

**Medium:** Media are carriers of information between a sources and a receiver. Such vehicles are considered instructional media when they are used to carry message intended to change behavior.

**Method:** Methods are the procedure of instruction that are selected to help learners achieve the objectives or to internalize the content or message.
2.1 The Properties of Media

Good teachers have been using instructional media for centuries. Jesus Christ draws picture in the sand and used objects in the environment as teaching media. Comenius wrote ‘Orbus Pictus’ (the world in picture) in 1658; it was the most popular illustrated text book ever written for children. As new invention derived benefits from the new developments – printing, recording, photography, radio, television and the computer all contributed to the vast array of resources now available.

Three properties of media help to indicate why they are used and what they can accomplish that teacher alone cannot accomplish. These properties affect the ways in which each medium is used.
2.1.1 The Fixative Property

This property permits the capture, preservation and of an object or event. Photographic film, audio tape and video tape are raw materials for fixing these objects and events. Once a photographic is made or a voice is recorded, the information has been “saved” and is then available for reproduction at any time. This property enables the record of an event to be transported through time.

2.1.2 The Manipulative Property

This permits the transformation of an object or event in many ways. The event can be speeded up as in the opening of flower but which is recorded by time – lapse photography with a motion picture camera, or event may showed down by replaying a motion picture film or video tape at a slower speed than that at which it was recorded. Complex details may be simplified by highlighting important component of the subject.

2.1.3 The Distributive Property

“While the fixative property of the media allows us to transport an event through time, the distributive property permits us to transport an event through space, simultaneously each of potentially millions of viewers with a virtually identical experience of an event”, (Edling, 1972). The distribution of media within the educational setting is usually limited to a single classroom, or in the case closed
circuit television, to several class rooms within a school district or region. Once an object or event is recorded on film, tape, or the printed page, it can be reproduced in an almost any location at any time. For this, with mass distribution system, such as television and radio the potential number of viewers and listeners is dramatically increased.

2.2 Designing of Instructional Media

Instructional media design refers to application of well-defined procedural steps for designing instructional resource materials. A number of related activities are involved which include identification of objectives, formulation of instructional strategies, development of media based components, evaluation of learning outcomes etc.

![Figure 2.2. Basic Steps of Designing Instruction](image)

Figure. 2.2. Basic Steps of Designing Instruction
Media meant to be used for instruction must be well planned, carefully prepared and then used effectively.

**Planning**

Designing instructional media demands a great deal of planning. Planning is a structured procedure, acquiring organization and logical sequencing of components to be taught. The components then must be integrated into a unified whole. To develop useful resource of lasting value, one needs to put both planning and creativity into action. The two seemingly opposed processes are in fact, central to this activity.

Although most development work is planned, at times situations may arise that the work has to be done on the spot. In such situations, no original thought should be underestimated or ignored. Often the most unconventional ideas contribute significantly to the structure, appeal and effectiveness of media being developed. To develop an effective and interesting media product intermingling of both systematic planning and creative thinking become essential.

**Preparation**

When initial planning is completed, one has to get started with the preparation of developing the materials. At this stage, a different set of decisions need to be taken. It is important to decide how much investment in terms of money
and time is justified; how much work should be done by whom; which are the areas
in which expert help may required.

The important steps in preparation of instructional media are

1. Identification of content
2. Preparation of the script or story board
3. Identification of format
4. Identification of location
5. Recording
6. Editing
7. Generation of graphics or sketches.
8. Narration
9. Validation

The most important step in preparation of any media-based resource
material is the development of script or story board. Story board is a sequence of
scenes, frames or units in which desired media format is arranged for presentation. It
is like the blue print of a building. It helps one to think clearly and take correct
decision. It saves time and cost, ensures continuity and put the director in total
command. Another advantage of preparing the story board is that the different tasks
become clear and one is in a position to take decision regarding identification of
tasks and delegation of work.
Finally, it is important to validate the material developed. The media option should be evaluated for its academic and motivational value. It is good idea to preview the material with some colleagues mostly to identify areas, which have not been included. It is always possible to create a hand to cover such points.

The start of a unit or a topical study is the time to examine or develop objectives. It is also the time to clarify, through an overview conducted with and participated in by the entire class, what will be studied and accomplished. This too, is the time to motivate students to participate in required and optional learning activities that may be undertaken.

The introductory phase of teaching and learning is also the time for a systematic review of options for the use of media or media related activities that will be undertaken throughout the period of study. It will be appropriate, at this time, to invite school media centre personnel to work closely with the students in bringing together a variety of materials to be found in collection in the school.

Generalized principles of media selection and use:

- No one medium, procedure, or experience is best for learning.
- Be sure use of media are consistent with instructional objectives.
- Recognize that, to adapt materials to specific programme purposes, must thoroughly
• Media must also be considered for their appropriateness for use in the instructional mode selected.

• One’s own preference must not stand in the way of choosing or using particular media.

• Be aware that some otherwise excellent media may become second-rate in their instructional effect if used in poor environment.

• Realize that student experiences, preferences individual interests and capabilities, and learning styles may influence results of media use.

• Keep in mind that resources and learning experiences are not necessarily good or bad simply because they are concrete or abstract.

2.3 Evolution of Education through Technology

The intricate play of instruction, instructor and technology has given rise to the concept of educational technology or Instructional technology. It includes, Technology- of education and in education. In more formal words educational technology is development, application and evaluation of systems, techniques and aids to improve the process of human learning.

According to the council for educational technology, U.K., educational technology helps to meet the challenges of the new learning environment. Technology in the form of different media options offers solution to cope with aii
these challenges. Advances in telecommunication have metamorphosed instruction to time shift and place shift instruction.

The two magical devices- satellite dishes and fibre optics - has radically changed the education delivery system; it is now possible for individuals to access text, pictures, video, data, and two way video instantly from any corner of the world. The astounding impacts of such technologies are powerful enough to cause day –to-day changes in the prevailing system of education.

Figure 2.3. Evolution of Instructional Media.
2.4 Learning Theories and Instructional Media

Learning refers to the new knowledge, skill or attitude that develop in an individual due to interaction with information and environment.

As defined above learning is the utilization of knowledge perceived or information communicated for the achievement of pre-defined goals. Learning had been and is still an area of interest for the psychologists and the theories developed by the eminent personalities help us to understand the process and in turn guide us to enhance the process.

Most of the theories have in their own way influenced, the way instruction is designed and consequently the way, media should be designed to enhance instruction. Therefore it is important for a teacher who intends to design and develop media to keep in mind the key concepts propagated in these theories. Some well-known theories which have close relationship with media are:

I. Operant Conditioning Theory
II. Component Display Theory
III. Elaboration Theory
IV. Information Processing Theory
V. Social Learning Theory
VI. Attribution Learning Theory

VII. Concrete-abstract Continuum Theory

VIII. Intellectual Development Theory

I. Operant Conditioning Theory

This theory, proposed by Skinner, views learning as a change in behavior. Every time a person acquire new knowledge, learns new skills or experiences an event, the individual’s behavior is modified. When the stimuli (The Message) and the response (the learning) pattern are repeated, the individual becomes conditioned to response and learning takes place.

ii. Component Display Theory

The propounder of this theory, Merrill classifies outcome of learning in two dimension- content and performance. According to this theory each learning segment must have clear objectives and the selected content should be delivered in a planned manner using statement of rules, recalls, attention focusing devices, mnemonics and feedback.
iii. Elaboration Theory

Reigeluth established a theory focusing on organization of content in terms of complexity. It emphasizes that, elaborations which relate to more than single or concept are more effective in promoting learning. The theory emphasizes that at each step the learner should be informed about the procedure as whole.

iv. Information Processing Theory

Norman with the help of this theory claims that the way an individual learns depends on his ability to select, encode and store information. The theory advocate the use of advanced organizers, instructional aids and cues to enhance learning.

v. Social Learning Theory

With the help of this theory, Bandura focuses on personality factors and interaction amongst people. According to this theory, learning takes place through an individual’s ability to observe and imitate behavior. It proposes that learning takes place through the three –pronged interaction amongst the model, the learner and the environment. This theory indirectly recognizes the forceful role that media can play in enhancing learning.
vi. Attribution Learning Theory

With the help of this theory Weiner, focuses on the different ways in which individuals understand events and messages. The search for understanding being the prime motivator in human behavior, this theory lays a great deal of emphasis on motivation. Feedbacks from past achievements become a vital motivating factor.

vii. Concrete-Abstract Continuum Theory

The Psychologist Bruner in developing a “theory of instruction” proposes that the instruction provided to a learner should proceed from direct experience (Enactive) through iconic representations of experiences (as in picture, video, films etc) through Symbolic or digital representation (as in words).

He further states that “the sequence in which a learner encounters materials” has direct effect on achievement. In short, learning is facilitated when instruction follows a sequence from actual experience through iconic to symbolic representations.

viii. Intellectual Development Theory

Three concepts are outlined by Piaget, to explain how mental development occurs. They are schema, assimilation and accommodation.
Schema are mental structures used to identify, process and store incoming information and experiences, they are structures of cognitive development that change by the processes of assimilation and accommodation.

Assimilation is the cognitive process by which a learner integrates new information and experiences into existing schema without changing its basic structure. And accommodation is the process of modifying existing schemas or creating new ones.

2.5 Production of Video Resources

There are many situations in which it is impractical and not cost-effective to produce new video materials. In some of these situations it is possible to identify existing resources and off-the-shelf videos which, after the development of further learning support materials, will achieve the identified training need and objectives.

The activities of building support materials and re-proposing video for identified learning needs must be regarded with an appreciation of which constitute best practices. It is quite possible to select video resources which seem to do the job, and later to find that despite special training strategies and the development of new support materials the trainees do not find the video to be worthwhile. It is one thing
to say that the practitioner and the learner should make do with an existing video sources, it is another to perform an analysis that shows making do can lead to effective learning.

The video obeys certain rules of filmic reality; it often contains scene and locations that give the impression of being other than they really one. Sometimes, it is not possible to alter radically the way parts of the video- such as certain scene or shots are presented because the filmic reality is disturbed. The video has a filmic structure possessing narrative lines, characterization, and visual and audio continuity techniques that do not always lend themselves to uses other than those for which the video was originally produced.

The process of developing learning support materials must be based on a prior identification of the target audience and an initial definition of the learning objectives. The development should be set in terms of the overall strategy for the organization and must specify the resources, costs and project time scale. In summary, therefore, the development should

- Identify the target audience
- Define learning objectives
- Establish resources, casts and time scale
Once the basic parameters are known, the development of the learning support materials can commence.

The next stage is the practitioner to become familiarized, or refamiliarized, with materials. It is worth checking at this stage that the practitioner is clear about the learning objectives and the target audience because this will help the practitioner to determine the depth and breadth to which he or she must be familiar with the materials.

When ready, the practitioner can begin to determine the learning materials that should accompany the audio. The entails working out the media –mix, devising the structure of the support materials (which will often be primarily paper based), and identifying any necessary presentation sessions and tutor assessment. Once an initial draft of the basic structure of the support materials has been decoded, the practitioner is ready to start looking at different likely routes that learners can take through the materials to achieve the learning objectives. At this stage, the structure will often still be altering as the practitioner works out the best combination of learning activities and content coverage that progress the learners, builds their confidence, improves their study skills, and increase both group and individual motivation thus, the practitioner should:

- Clarify the content coverage that the objectives and target achieve require him or her to be familiar with.
• Devise an appropriate media-mix, presentations and assessment strategy
• Prepare an initial draft structure of the learning materials
• Identify the possible learner routes through the materials.
• Redesign the structure and develop the content of the learning support materials.
• Devise learning activities and content coverage that
  ➢ Progress of the learner
  ➢ Build confidence
  ➢ Increase motivation
  ➢ Improve study skills

Often, the development of learning support activities support reading and support questions that, when combined, help the learner to use the video resources effectively. The support materials will often be in the form of hand outs, worksheets, study guides, case studies or learning packs.

Once draft is written it is work asking some colleagues to offer suggestion for improvements. Following these improvements, the re drafted version of the support materials is then ready for trailing on a small representative sample of the target audience. The trailing is followed by further re drafting and submission for fill implementation and follow up evaluation of their effectiveness in achieving the
learning objectives for the target audience. Thus, in the development of support materials, the practitioner should

- Draft the support materials like hand books, work sheets, study guides, case sheets etc.
- Support activities
- Support readings
- Support questions

In the context of instructional design, Kemp (1980) suggests that all audio visual materials should be designed and produced using a general instructional design plan:

- Choose topics to be treated.
- Static general purpose to be served by the topic
- Enumerate the important characteristics of the students group for which the instruction will be designed.
- Inculcate the subject content that will lead to the objectives
- Specify the learning objectives to be achieved as related to the content and purposes.
- Develop the pre-test to determine each students back ground and present level of competence with the topic
• Select teaching/learning activities and instructional resources that will treat the subject content to accomplish the objectives.

• Coordinates necessary support services, such as budgets, personnel, facilities, equipments, and schedule to carry out the instructional plan.

• Evaluate student learning in terms of the accomplishment of the objectives, with a view to revising and re-evaluating any phases of the plan that need improvement.

In the context of selecting specific audio visual materials and approaches, Kemp (1980) mentions a number of factors for consideration.

Selection criteria

1. Is the content useful and important to the learner?
2. Will be interesting to students?
3. Is there direct relationship to a specific objective or problem-solving activity?
4. How will the format and presentation treatment affect the organization and sequence of learner activities?
5. Is the material authentic, typical, and up to date?
6. Have facts and concepts been checked for accuracy? Are the producers expert in the subject matter or have they employed competent consultants?
7. Do the content and presentations meet contemporary standards of good taste?

8. If controversial, are both sides given equal emphasis should they be?

9. Is bias or propaganda evident? If so, how should students deal with it?

10. Is technical quality satisfactory? Are images clear? Narration or dialogue intelligible? Colour, motion, and special effects used authentically and creatively?

11. Do content and structure reveal careful planning by the producer?

When developing learning support materials, the developer must ensure that the content is important to the learner and that there is sufficient degree of learner interest in that learning content. The support material should have specific learning objectives or problem-solving activities. The presentation and format of the support materials should be designed with an understanding of how they can affect the activities the learner undertakes. The material should be authentic, typical of what they are trying to portray and up to date. They should also be accurate and at the appropriate level of expertise. This may require contracting in subject specialists where the organization does not have evidently well planned and effective. Also, the presentation and the content of the materials should be in good taste by conventional standards. The production should be of the appropriate technical standard and quality, wherever, the materials is controversial, the emphasis should be clear, and the treatment must be apparent and explained when there is evident bias or propaganda.
One of the special features of the use of video in groups is that it puts individuals into new situations that requires additional or even new routines of ‘face-work’. It is noticeable that group watching a video can less exploratory in stopping, searching and replaying the video disc/tape.

The discussion of video in large and small group is a special type of activity that occurs fairly in frequently in most people’s education and training. The use of video as a technique of self-confrontation and feed back is more unusual still. What Goff man’s research emphasis is that the practitioner and learner need to be aware of how the group-based learning situation creates expectations for their behavior and communication. The viewing and discussion of video in groups can be very beneficial where the individuals are flexible in their operations and of the video and treatment of the learning task.

**Environmental Ethics**

Ethics is concerned with:

- What is normally good behaviour
- What makes person good and
- What principles must use in decision making

*As one of the Greek philosophers said, the goal of studying ethics is not to know what is good, but to become good; otherwise no meaning in studying it.*
All over the world, a general feeling has been expressed that we must respect the rights of future generations. It is the duty of the present generation to protect the environment with all its biodiversity and its indigenous cultures for the generations to come. The ancient sculptures of India show very clearly how the environment as a whole was treated as one entity in the country. We have always believed that man is the part of nature, not that man is master of nature. Our principle has been ‘vasudhaivakumudambakam’, meaning the whole world is one family.

Yet there is need to inculcate feeling of love towards nature in each and every one on this earth. The earlier this is done the better, because despite of the vast information we have on the dire consequences of human interference in the biosphere, many of our activities continue to harm the environment. We destroy forest covers, drain wet lands and pollute air, water and soil in various ways. The danger that human activities may lead to rising of sea levels and global climatic changes remains true. It is high time therefore that environmental education becomes part of the education process at all levels.

The environmental degradation affects women the most. Women feel the maximum brunt of water scarcity, deforestation, lack of good alternative energy sources etc. It has always been women whose health is not taken care of properly in society. On the whole, girls and women do not get the share due to them in society.
Unless this state of affairs changes, society as a whole can never progress. And only in an enlightened society can there be any environmental awareness.

Destroying natural resources belonging to future generations: If the present rate of destruction of forests and water bodies and coral reefs continue, what will be left for the future generations? These questions ponder. We do not own the earth or its resources. We are only custodians. We have to pass on these resources intact to our children. In fact, we have not worked hard to get these resources in the first place. These have been handed over by our forefathers. So now it becomes our duty to preserve them as best as possible for the benefit of future generations. Living in a clean environment is everyone’s right. One generation cannot deny that right to another generation.

When forests are cut down, many animals have nowhere to go and they finally perish. The felling of even single tree changes the environment. Many birds lose their nests, many squirrels, snakes etc. lose their shelter, many plants living in the shade of the tree die and countless microorganisms and small insects and worms in the soil are deprived of their food, as they eat the leaves fallen from the tree. In the absence of the tree, soil erosion, light intensity, temperature and atmospheric humidity decrease. Thus cutting down of one tree is destroying one entire ecosystem.

When the temperature of sea water rises even slightly as a result of our activities, polyps that make the coral reef die. When mercury and other such toxic
chemicals from our factories are released into rivers, innumerable fish die. We drain wetlands, home to a variety of unique animals, only to make homes for ourselves. The list is truly endless. We owe it to our children that they also enjoy the benefits of the vast biodiversity on the planet. We have no right to destroy it.

While thinking or talking about animal right, the first thing for us to remember is that we are also animals. Cruelty to animals is wrong ethically just like cruelty to fellow human beings is wrong, ethically. The animals are never cruel to us; they do not harm us for the sake of harming us. Lions and tigers kill their prey only when they are hungry. That is not wrong. Likewise human beings also catch fish or kill animals for food. That is the part of the balancing system of nature. But men kill for sport too. This is cruelty. They cage birds; this is cruelty. We must respect the rights of animals, especially as they cannot talk. Finally, understanding that by protecting the animals, we are benefiting ourselves to plain logic. In fact, what is good for nature is good for man as man is the part of nature.

2.4 Ethics and Morals

There are positive laws and natural laws in the world. The positive laws are the laws that are enforced by the police and the judiciary. But to enforce the right of the oppressed or animals, a different kind of law is necessary. Such laws are called natural laws. These are based on ethics and morals. These are the same to all, irrespective of countries, religion, caste, creed, age, sex, etc.
If human beings have the same right everywhere, it is because of ethical and moral standards. These are universal in application. Yet, in some countries, where the laws of the land are not being implemented truly, sections of people remain oppressed and there may not be any solace at all as the oppressors naturally have no ethical or moral feelings.

For an individual to feel ethical towards the planet earth and its resources, environmental education is a must from childhood. If a child grows up admiring the beauty of nature and its infinite variety, he will definitely be concerned about the environment throughout his life. This will lead to the making of successive generations concerned about nature and natural resources.

2.5 Throwaway Society Ethics

As Science and technology advance, more and more finished products are being produced every year by the industry for the comfort and luxury of man. Part of the wastes produced during their manufacture may be blown away by the wind or carried away down the stream. Steps may not be taken to dispose them of safely. If the byproducts or side products are utilized in any way, throwing away of these can be avoided, which will also help in keeping the environment clean.

High level of urbanization has resulted in the mushrooming of towns and cities all over the world. While in the MDC’s (more developed countries) the
disparity between the rich and poor is not very high, in the LDCs (Less developed countries), this disparity is very high. More and more people believe that more money would improve their life. So people dream of a life of wealth. All their efforts are directed towards maximization of wealth. So what is happening to the earth? Unwanted things are accumulating in the ecosystems. Plastic are the main culprits. In India the cattle and buffaloes were roaming around the streets. These animals eat the plastic bags in the absence of good green grass and develop tumors in their stomachs. In Lucknow, recently, cows have been operated to take out even ten or fifteen kilograms of plastic from their stomachs.

Plastic of today are the electronic wastes of tomorrow. There is no limit to electronic equipment like televisions, computers, mobile phones, calculators etc. thrown away by the people. Earlier, this was a problem for MDCs alone. But now this is a serious problem for LDCs like India also. Most of the industrialized nations are thus high-waste or throw away societies. They try to sustain their economic growth by increased input of raw materials and also energy. Utilization of fossil and other forms of energy is also maximum in developed countries. The wastes finally end up in low waste societies. This is absolutely against all ethics.

It is however welcome change that ‘recycling’ is catching up everywhere. Many companies are also eager to become ‘zero waste companies’ by recycling or reusing its waste materials in various suitable ways. These business houses recycle their by-
products and do not send them to landfills, as was being done earlier. New revenues are generated also in the process. This has led to cost reduction and increased profits. Such activities will help in reducing the number of throw away societies in general.

2.6 Sustainable Earth Society Ethics

Many aspects of nature can be classified as sustainable and non sustainable. Resources, economy, development, society etc. can all be sustainable or otherwise. Sustainable development has the following characteristics:

- It is an overall socio-economic growth of the society.
- It is done through rational exploitation and optimal utilization of resources.
- Eco friendly technologies are adapted for the process.
- Environmental education is necessary for sustainable development.
- It involves better organization.
- It lead to sustainable economy.
- Environmental quality and ecological balance are maintained.
- It ensures continued yield of resources to the present and future generations.

This means that the final goals of sustainable development in a society are two:

1. To provide a strategy(action plan) that will improve the quality of human life, and,
2. To provide a strategy that ensures the vitality and diversity of the earth.
Sustainable development must be beneficial for the people and also for the environment as a whole. The quality of environmental resources must not decrease and at the same time the society would develop. If development is sustainable, then the society will automatically become sustainable.

Some guidelines for a sustainable earth society are:

- Improve quality of human life
- Respect each other for harmonious coexistence and community life.
- Conserve biodiversity
- Minimize utilization of non-renewable natural resources and environment.
- Maintain earth’s carrying capacity.
- Motivate every individual to take care of the environment.
- Link development with conservation
- Establish global treaties.

2.7 Ethical Guidelines

Ethics had been strong in all societies in the earlier times. All over the world, people led simple lives. In those days, natural resources were aplenty. It was believed that these will never end. Gradually, population increased greatly in some countries like India and China. Industrial revolution that spread in the west increased people’s desire for luxury and comforts. Everywhere in the world, man’s needs increased as
his greed grew. This led to a depletion of natural resources. The situation remains the same today. There is no limit to man’s desire and wants. If this tendency is not checked and if we do not take care to replace the resources we are using, the shortages are sure to grow to dangerous proportions.

In India, nature used to be worshipped in the earlier days. The wisdom of the sages and other knowledgeable persons had prevailed upon the common masses. Thus many trees like Peepal, Bargard, Neem, kadam etc. and small plants like Tulsi used to be worshipped. In tribal areas, there were festivals related to trees like Karam. They also protected Mahua trees which provided edible flowers and oils from seeds and alcohol.

Many animals were also considered sacred. Many of them have been depicted as vehicle of gods and goddesses or associated to them in different ways in the Hindu mythology. For example, eagle, bull, peacock, swan, mouse, tiger and owl are respected as vehicle of Vishnu, Shiva, Karthik, Saraswathi, Ganesh and Lakshmi respectively. Animals like cow, snake, and monkey, are associated with Krishna, Shiva, and Rama respectively. Hanuman was in the form of a monkey while Jambhavan was in the form of a bear. Lord Vishnu’s earlier incarnations were all in the form of different animals like fish, tortoise, bear etc. such associations used to motivate people to love and respect these animals and birds.
There were unwritten rules against polluting water bodies. Many rivers in India are considered holy. Some well known examples are Ganga, Yamuna, Krishna, Godhavary, Narmadha, Sarayu, Pampa, Netravathi etc. The mountains like Himalaya, Vindhiya, Satpura, etc.; hills like Nilgiri, Nallamala, Sabarimala, Mahadeo, Rajmahal etc. are all venerated by the people. Forests are thought to be governed by Van Devta’s, or God or Goddess of forest. In this way, plants, animals, forests, Mountains, Rivers, in fact, all parts of nature were loved and respected in India.

There was the practice of setting up sacred groves in many parts of India. In Kerala, these are called ‘Kavus’. These are dedicated to different gods and goddesses. Kavus dedicated to snakes are also common. A sacred grove is a patch of dense vegetation including a small shrine and a pond or stream. The vegetation is so dense and undisturbed and pollution free that many rare species of plants and animals live here. The ponds and streams never dry in the cool and humid environment and conserve precious water. The ‘Kavus’ are owned by families who take every care to maintain them. Big sized sacred groves are maintained by a few families together or the whole community. The belief that gods lived in the groves helps the owners to look after them well. The non-believers, among Hindus themselves and also other religions, have often contested to the existence of the sacred groves. But it is good sign that environmentalists have come to their rescue. Now the government has also decided to protect them.
Mahatma Gandhi and many other great men of India preached and practiced ‘plain living and high thinking’. His principle of Enoughness is very popular. “The earth provides enough for every one’s needs but not everyone’s greed”. Simple living will automatically reduce overexploitation of natural resources. Many great men of the past had motivated people to protect the plants and animals. Ethically, Swami Vivekananda (1893) said, “Not injuring any living being is a virtue’ injuring any being is a sin.” Though this is not possible fully as many plants and animals are eaten, the words can be followed to avoid cruelty to them and also not to kill or injure for sport.

It was environmental ethics that motivated Rabindranath Tagore to set up Santhi Nikethan. This is a beautiful concept where lessons are imparted to students in the open, under the trees, in natural surroundings. This makes the students nature lovers.

There can be many ethical guidelines to prevent the earth from further degradation. If these guidelines are followed, environment on the earth will improve greatly.

For Conservation of Vegetation

- Plant trees wherever possible
- Prevent cutting of trees
• Know the medicinal value of various plants and then to use.

• Pass on the information to others so that others will take interest in protecting medicinal plants

• Paper is made from wood; reduction in use of paper amounts to cutting of lesser number of trees. Therefore, use recycled paper if possible.

• Do not crumple paper; only tear it into pieces before throwing. Because crumpling breaks the fibers and reduces the quality of recycled paper.

• Do not waste paper; use both sides.

• Reuse gift papers

• During functions, give potted plants in place of bouquets to guests.

• Cultivate love for nature in the young children at home; tell them all about the usefulness of each part of nature; tell them stories concerned with nature.

For Conversation of Animals

• Take good care of pet animals and birds

• Do not throw stones or disturb small animals like lizards, chameleons, birds etc.

• Do not tease animals in the zoos

• Arrange for water containers outside the homes for watering animals, if possible
- Attract birds to the garden by providing water for them
- Break leftover food into small pieces and throw them to birds.
- Instead of throwing banana skins etc. in the dust bins, give them to cows that are roaming in our locality
- Do not catch or kill butterflies, moths, etc. they along with many other insects help in pollination.
- Do not kill earth worms; they improve soil quality.
- Do not catch or kill dragon flies; they eat other harmful insects. Remember that dragon flies are gradually becoming extinct.
- Do not use products made from the skin of snakes, crocodiles, leopards etc. these are endangered animals.
- Do not use ivory products for decorating homes.
- Do not bring small wild animals home for rearing them; most probably they will die; moreover, it is against the law.

For Water Conservation

- Conserve by practicing roof top rainwater harvesting
- Do not waste water at home.
- Report against leaking pipes in public places to authorities.
- Do not direct sewage water on to the road, rivers etc.
- Do not keep the tap on while brushing or shaving
• Do not throw garbage into the water bodies.
• For potted plants, reuse the water used for washing vegetables and fruits.
• Water the plants in the morning to reduce evaporation from the soil.
• Use eco-friendly cleaning solutions in place of chemicals.
• Do not cement our courtyard; maintain a lawn instead. The green grass allows water to filter down the soil, it looks beautiful too.

For Waste Management;

• Use dustbin and do not throw garbage on the streets.
• Keeps parks and gardens clean
• Do not throw used plastics here and there
• Use paper or cloth bags in place of plastic bags for shopping.
• Make compost manure at home from waste materials like skin of vegetables and fruits, and other biodegradable waste materials.
• Grow plants like banana, kachu etc. near outlet of water from bathrooms, kitchen etc.
• Segregate solid wastes at home so that all degradable wastes go in to the compost pit while only the non degradable waste like plastics are deposited in the municipality bins.
• Do not burn plastic wastes at home; the fumes are also harmful.
For Soil Conservation

- Do not leave open areas in your garden with any vegetation.
- Provide a cover to the soil by dead leaves and twigs, cut grass etc.
- Raise the edge of the garden space so that no water flows outside.
- Use organic manure like cow dung, green manure, compost, vermi compost etc. in place of chemical fertilizers to maintain soil fertility.
- Use bio pesticides like neem oil cake in place of chemical pesticides.
- Get involved in community programmes like tree plantation on vacant lands nearby.

For Conservation of Energy

- Reduce electricity consumption by all possible methods like:
  1. Switching off fans and lights, television, computer etc. while not in use.
  2. Use tube light in the place of ordinary bulbs.
  3. Using energy saver bulbs like LED lights.
  4. Placing study table near window to use sunlight in day time.
- Use alternative energy source like:
  1. Biogas
  2. Solar energy
• Avoid waste of petrol by:
  1. Walking or cycling as much as possible.
  2. Arrange car pool instead of each person using his own car.
  3. Trying to use public transport like trains and buses.
  4. Servicing vehicle regularly and getting emission checks done.

The list can go on and on. All the practices mentioned here and more are easy to follow. The only thing needed is determination.

The ethical guidelines can be summarized as follows:

1. We should understand that we are part of the nature and behave accordingly.
2. We should try our best to conserve all the resources that nature has gifted us with and not waste any resource.
3. Where we have to take out the resources, we must see to it that they are replaced.
4. We should not degrade the earth’s physical, chemical or biological capital.
5. We must do Environmental Impact Assessment (EIA) studies before starting any project.
6. To find out whether our projects will harmful for the future generations, we can do a GIA study also (Grandchild Impact Analysis)-this is a recent concept.

7. We should honor the right of all beings to live on the earth.

8. We should try hard to preserve the present bio diversity in nature.

9. We should not allow certain human communities also, like forest dwellers, to perish.

10. We must be kind to animals.

11. We must try to lead simple live and motivate others to do so.

12. We can and must think globally, but we must act locally to solve different problems.

*Those who follow these ethical guidelines are True Earth Citizens*