UNIT 6 INSTRUCTIONAL MEDIA AND MATERIALS-II

Structure

6.1 Introduction
6.2 Objectives
6.3 Audio Media
   6.3.1 Human Voice
   6.3.2 Audio Tape or Tape Recording
   6.3.3 Radio
6.4 Visual Non-projected Three-dimensional Media
   6.4.1 Models
   6.4.2 Mock-ups
   6.4.3 Diorama
   6.4.4 Maps and Globes
   6.4.5 Puppets
   6.4.6 Holograms
6.5 Visual Projected (Still) Media
   6.5.1 Slides
   6.5.2 Filmstrips
   6.5.3 Microfilm and Microfiche
   6.5.4 Overhead Projector
   6.5.5 Computers
6.6 Audio-Visual Projected (with Motion) Media
   6.6.1 Motion Picture Film
   6.6.2 Instructional Television
   6.6.3 CCTV
   6.6.4 Slide Tape Presentation
   6.6.5 Interactive Video
6.7 Let Us Sum Up
6.8 Unit-end Activities
6.9 Answers to Check Your Progress
6.10 Suggested Readings

6.1 INTRODUCTION

In Unit 6, we discussed the need and importance of instructional media and materials in the instructional process. We also presented a broad classification of teaching-learning aids. We discussed various kinds of verbal printed materials and non-projected two-dimensional visuals. In this unit, we discuss audio media, visual non-projected three-dimensional media, visual projected (still) media and audio visual projected (with motion) media. We have already discussed some media coming under these categories in Unit 17, Block 4, i.e. “Instructional Media and Related Skills” of course ES-331: Curriculum and Instruction. However, we have again repeated some of these media to provide you a holistic perspective.

6.2 OBJECTIVES

After going through this unit, you will be able to:
  • describe the instructional uses of radio;
  • differentiate between models and mock-ups;
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- define a diorama and discuss its instructional value;
- describe the role of maps, puppets and holograms in the teaching-learning process;
- prepare and use slides and filmstrips;
- use the overhead projector (OHP) in the classroom instruction;
- prepare and use OHP transparencies,
- suggest ways of using computer-assisted instruction for individualised instruction;
- discuss the role of instructional televisional; and
- use interactive video for individualised instruction.

### 6.3 AUDIO MEDIA

Media related to audio have already been mentioned in Unit 6 of this Block. In this unit, we discuss some of these media.

#### 6.3.1 Human Voice

The human voice is the most common form of the audio medium. It existed right from the origin of human beings. When human beings talk to other fellow human beings, they create sound. Through this sound, messages from one human being are transmitted to another. In the classroom, when a teacher talks or lectures, the messages are transmitted from him to the students in the form of sound. How do you use this most natural medium of communication more efficiently? You can learn about it from the Art of Drama; how to modulate your voice, how to express your feelings, where and when to emphasise, when to pause, etc. All these and related skills are important to you as a teacher and communicator.

#### 6.3.2 Audio Tape or Tape Recording

Audio tape or tape recording is a more popular teaching tool. The teacher can make live recordings of student and teacher conversation/dialogues etc. as it is much easier to prepare these tapes than a grammophone record. This is very useful in independent study situations. A tape recorder can record a message and play it back or play a recorded tape.

There are several variations of tape formats. But the most common for school use are the reel to reel (1/4 inch open reel) and the cassette. The 1/4 inch tape can be played at several tape speeds. Reel-reel machines typically have three settings for tape speeds (rated in inches of tape per second passing by the tape leads). These are 1/4 inches per second (ips), 3 3/4 ips, and 7 1/4 ips. The amount of tape on a reel can range anywhere from a few feet to as much as 36,000 feet.

![Fig. 6.1: Reel-to-reel tape recorder; a cassette tape recorder](image-url)
A cassette tape recorder has a number of features which reel-to-reel systems lack. It is smaller than reel-to-reel machine. Many operate on batteries as well as on ordinary alternating current. Hence, they are portable and are also inexpensive. The cassette is a plastic case, which contains two tiny hubs; the tape is 1/4 inch wide, just half the size of reel-to-reel tape. Cassette recorders and playback units run at 17 1/2 ips.

A tape recorder is very simple to operate. It is very useful in teaching as well as in individualised learning. However, it is easy to erase a recording if care is not taken. The picture of a reel-to-reel tape recorder and a cassette tape recorder is given in Fig. 6.1.

6.3.3 Radio

Radio is a popular mass medium in almost all countries of the world. It has the maximum outreach. Almost everyone irrespective of economic background can afford to have a radio set. It has the unique characteristic of speed and immediacy. It was thought in 1917 that mass education can be achieved through radio broadcasts. In India, the first radio station was established in Bombay in July 1927. Then the next station was set up in Calcutta and in Delhi it was set up in 1936.

In India, radio broadcast is done through All India Radio (AIR) services. School broadcasting was started in 1937 from Calcutta. Since then, the school broadcast has increased. Most AIR stations broadcast educational programmes for schools.

The radio medium is very effective for broadcast of lectures by eminent educationists, scientists, historical statements, etc. It is a rich medium for broadcast of drama, stories, commentary, sports news, educational news and educational programmes. Radio medium is popular in both urban and rural settings. Radio programs are generally prepared on topics which are more suitable to verbal communication. Sound, music and special audio effects can be used in audio programmes as to make them more effective. These techniques help create visual images through sound. Non-broadcast mode (i.e. specially produced audio cassettes) is also useful in classroom instruction. Institutions such as Central Institute of Educational Technology, New Delhi, State Institute of Educational Technology, Educational Technology Cells of State Councils of Educational Research and Training produce need-based audio preprogrammes for school children. We will discuss radio and audio programme further along with their advantages and disadvantages in Unit 9 under Block 3 i.e. “Principles of Software Development”.

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<tr>
<th>Check Your Progress</th>
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<tbody>
<tr>
<td>Notes:</td>
</tr>
<tr>
<td>a) Write your answer in the space given below.</td>
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<tr>
<td>b) Compare your answer with the one given at the end of the unit.</td>
</tr>
<tr>
<td>1. Which is the oldest form of audio media?</td>
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<tr>
<td>2. Why is radio called a mass medium?</td>
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6.4 VISUAL NON-PROJECTED THREE-DIMENSIONAL MEDIA

The visual non-projected three-dimensional media include models, mock-up, diorama, globe, map, hologram, puppet and specimen. We discuss these media in this section.

6.4.1 Models

Models are used for demonstrating the three-dimensional representation of real things (model of an eye), or abstract things (model of solar system). They can be used in a wide range of
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Instructional situations. They are particularly used for three specific purposes.

- as visual support materials in instructions;
- as objects for study or manipulation in individualised learning; and
- as construction project for individuals, small groups or even the entire class.

**Advantages**

Some of the advantages of using a model for classroom instruction are:

- They can reduce very large objects (e.g. model of solar system) to a size that can be conveniently observed and handled by you as well as by the students.
- They can be used to demonstrate the interior structures of objects or systems with clarity that is often not possible with two-dimensional representations, (cross-section of the earth, different layers of the earth).
- They can be used to represent a highly complex situation or process in a simplified way that can easily be understood by learners. This can be done by concentrating only on essential features, eliminating all the complex and often confusing details that are so often present in real life systems.

**Preparation**

We can prepare models in different ways but the use of the standard techniques mentioned will be useful.

- Use of cheap materials such as cardboard, hardboard, wood and wire to prepare static models like models of a dam, a building and the like.
- Use of modelling clay and plasticine to produce realistic models of living creatures, organs of a human body, etc.
- Use of materials like plaster of Paris and paper mache to produce a physical map of a continent, or a country, or landscape of a particular area.

**6.4.2 Mock-Ups**

Mock-ups are generally used in the teaching-learning process, when a teacher finds it difficult to provide first-hand experience to the learners. A mock-up is an operating model, designed to be worked with directly by the learner for specific training or analysis. Mock-ups represent real things. Sometimes, certain elements of a real thing are purposefully eliminated to draw the learners’ attention to others.

**6.4.3 Diorama**

A diorama is a still display system which combines a three-dimensional foreground of pictures, figures, etc. with a two-dimensional painted background, thus creating a highly realistic effect. Dioramas are useful media in the teaching of many subjects. One can use dioramas in subjects like history, geography, and biology etc.

**Producing a Diorama**

Ellington (1985) mentions the following steps in the preparation of a diorama:

1. Make a semi-circular base of the required size out of hardboard, thick card or some other suitable material.
2. Make up a strip of thin white card of suitable height that is capable of extending all the way round the curved side of the base, draw and/or paint the required background scene on this, and fix it to the base (e.g. with drawing pins).
3. Build up any landscape required in the foreground using plaster of Paris and paint this in the required colour(s).
4. Produce or acquire any materials required for the foreground and set them in position; such materials can include model figures (cardboard cut-outs, plasticine models, etc), model buildings, model trees, model ships, tanks or other vehicles, pieces of rock and any other materials that you feel will enhance the realism of the scene depicted. The picture of a diorama is given in Fig. 6.2
6.4.4 Maps and Globes

All of us use maps in one form or the other in our daily life. When we tour a new place, we take the help of maps. Thus, maps represent the earth or parts of the earth upon a flat surface. The earth is represented on the map through lines, dots, colours, words and signs. In social studies, maps are very important for learning many geographical, historical and economic concepts.

Globes are a scale model of the earth in three-dimensions. These are the only kind of maps that can give pupils a true conception of geographical relationships. Maps are broadly classified into the following categories.

i) Physical maps: These maps show climate, resources, rainfall, soil, etc.

ii) Political maps: These maps show the political division of countries, provinces, etc.

iii) Economic maps: These maps show crops land used, railroad, etc.

iv) Social maps: These maps show population distribution, languages, literacy rates of different provinces, etc.

v) Historical maps: These maps show the boundary of a particular empire, treaties, etc.

The significant aspects of a map, which should be taught to students, are:


6.4.5 Puppets

Puppets are a very useful media in the teaching of history, drama, and literary topics. They are available in the market or can be prepared locally according to the requirements. Puppets can be made of cardboard, cotton, colour and other locally available materials. They are used to dramatise any historical events like war, life of people during a particular historical period etc.
6.4.6 Holograms

Holograms are three-dimensional images of wonderful reality. These images are created on a holographic (lensless photography) plate without a camera. However, a laser light beam is used. One part of the beam is reflected off the subject onto a photographic plate and the other reflected off a mirror and onto the same photographic plate. Holograms are less frequently used in schools, as preparing them requires a lot of technical skills as well as equipment. They are also relatively costly to buy.

Check Your Progress

Notes:  
1. Write your answers in the space given below.
2. Compare your answers with the one given at the end of the unit.

3. What are the instructional uses of models?

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4. Differentiate between political maps and historical maps?

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6.5 VISUAL PROJECTED (STILL) MEDIA

Visual projected (still) media include slides, filmstrips, overhead projector, microfilm and computer.

6.5.1 Slides

A slide is a film transparency contained in a frame or mount. When pictures, diagrams, specimens, etc. are to be shown to students, they can be mounted on slides and projected on screen by the use of slide projectors or viewer. Slides are a versatile medium. They are easy to arrange and rearrange to meet a variety of instructional needs. There are several ways of preparing slides. Diagrams, pictures, graphs, and illustrations can be drawn on a glass slide using ink or by enclosing them between two glass slides (of 120 mm) and binding them together. A micro-specimen can be projected by mounting it on a slide (e.g., blood). These are usually projected, using an epidiascope. An epidiascope is also used to project opaque objects like a page book or a small three-dimensional specimen. Slides of 35 mm can be prepared by photographing objects, pictures, events, landscapes, etc. and by getting a dia-positive mode. An overexposed scrap film negative can be used to make an etching needle on it. Another way of improving it is to project photographic negatives, which is much cheaper in comparison to a dia-positive. Nowadays, it is possible to use a computer to design and produce photographic slides.

The slides have to be projected in a dark room. Since it is a visual medium, back-ground commentary on the content of the slides may be necessary. The teacher can make the commentary while showing the slides or it can be pre-recorded and played on the tape recorder along with the projection. But this has to be synchronised, i.e. the commentary and the visuals should match one another. A machine called synchroniser can be attached to the automatic slide projector. By adjusting speed of the commentary, the commentary and visuals can be synchronised.

6.5.2 Filmstrips

A filmstrip is a length of 35 mm film containing a series of still pictures intended for
projection in sequence on at a time (Gerlach and Ely, 1980). Just like slides, filmstrips can be prepared for pictures, diagrams, graphs, etc. But unlike slides, there is sequential movement of filmstrips on a screen. Filmstrips are projected with the help of a filmstrip projector. Filmstrips can be hooked to a tape-recorder to provide the commentary. The teacher can teach a lesson very effectively by way of stopping and moving different frames in a filmstrip. The teacher can prepare filmstrips by shooting appropriate frames in the film of a camera, and then sequencing them according to the lesson or theme he wants to deal with.

![A typical classroom filmstrip projector](image)

6.5.3 Microfilm and Microfiche

Microfilms are 35-mm films, which contain photographed reading material. Each frame contains materials of one page. The rolls of microfilm are placed in microfilm readers which project each page on a rear vision screen. Microfiche is the miniaturisation of microfilm. This is a sheet of film carrying many rows of images of printed matter. Microfiche is reduced in size in comparison to microfilm. Both microfilm and microfiche can be stored, retrieved and projected for reading. They have great educational potential.

6.5.4 Overhead Projector

Overhead projector (OHP) is getting to be widely used in the classroom and other teaching/learning situations. It is a medium through which still visual materials are displayed through projection on the screen. It is a very simple instrument and one does not require any special training to master its operation. The overall use of OHP can be seen under two categories:

i) Structure and operation of the instrument; and

ii) Preparation and use of the transparencies.

The hardware part is the instrument— the Overhead Projector. Today, it considered the most convenient tool in the hands of teachers. It has several added advantages over other visual teaching aids and especially over chalkboard or blackboard. The advantages are as follows:

i) It facilitates two-way communication: While writing on the chalkboard, a teacher loses his eye contact with the students, but when visuals are shown, the students can still be faced. In this way, the teacher can observe the reaction of the students about higher teaching process. This also helps the students to interact simultaneously with the teaching.

ii) It is a time-saving device: Visual materials can be prepared before coming to the class, (as well as during the session) thus saving a lot of time that is spent on writing on the chalkboard. Here, the materials can be prepared beforehand and arranged in the right order. Thus, teaching becomes tension-free as the teacher devotes more time on discussion than on lecturing and writing on the chalkboard.
iii) **It is very easy to handle:** For using and handling the OHP, one does not require any expertise. If any replacement is required, it is the electric bulb, and everyone knows how to replace a fused electric bulb.

iv) **No darkened room necessary:** Its visual materials do not require any dark room for developing or for projection. Thus students can take down notes throughout the lesson.

v) **It is easy to transport:** It is a comparatively lightweight instrument which is portable from one room to another.

### Structure of OHP

The OHP is a very simple instrument. It has one box which contains one electric bulb and a blower. The top portion of the box is covered with a glass plate.

There are three switches on the box. One is for connecting it to the power supply. Of the two other switches, one is for the blower and the other for the light.

![Fig. 6.4: Structure of an Overhead Projector](image)

#### Operation

Whenever you want to use the OHP, ensure that the glass plate, lens and the mirror are clear and dust free. Then connect the instrument to the power supply. For use, always switch on the blower first and then the bulb. Place the transparency on the glass plate. If needed, fix it with the help of fringes/clip. View the image and adjust the mirror in position to get the brightest and clearest image. It is advisable to fix the OHP in the classroom before teaching commences. This saves the time spent on adjusting it. Basically, to get the best of this instrument, it is essential to observe the following rules:

i) Position the projector and screen so that the latter can be seen clearly by all the students of the class (this can be done prior to the beginning of the lecture). In many cases it is best to place the screen in one of the front corners of the room, specially if locating it in a central position would deprive you of access to a fixed chalkboard or blackboard, which you might well want to use during the course of the lesson.

ii) Arrange the projector and screen in such a way as to eliminate or minimize two forms of key stoning.

The first type arises when the axis of projection is not at right angles to the screen in the horizontal plane, this can be eliminated by placing the projector opposite the centre of the screen.

The second type arises when the axis of projection is not in right angles to the screen in the vertical plane. This can usually be eliminated or made acceptable by tilting the screen.
forward (if this is possible). In the case of a fixed vertical screen, the only way to solve the problem may be to raise the level of the overhead projector itself, provided this can be done without blocking the learner's view of the screen.

Fig 6.5: The Two Causes of Keystoning in OHP Displays

iii) Adjust the distance from the projector to the screen so that the image fills the full area of the latter when properly in focus. Failure to use the entire area of the screen can make it difficult for students sitting at the back of the room to see the details.

iv) Make sure that the plate and head lens surfaces are clean and free from dust. Dirty or dusty surfaces can reduce image brightness and detract the clarity and quality of the display.

v) In using OHP, the blower switch is to be turned on first and then the lamp. After use, the lamp should be switched off first and then the blower. This is important because the blower maintains the temperature of the projector to the room temperature.

vi) The projector should not be moved from one position to another while in operations (because the bulb may fuse or get switched off when heated as a result of the jerk).

vii) It should not be kept in use continuously for a long period.

viii) Use of a voltage stabilizer is desirable, though this depends on the fluctuation of the power supply.

Preparing transparencies

The second important part is the design and production of OHP transparencies. The transparencies contain the instructional material that helps in achieving the pre-set objectives of the lecture/instructional package. Let us, therefore, have a systematic look at how to design and produce an OHP transparency.

There are two basic forms of OHP transparencies. One way is to prepare it on the continuous roll and the other way on a single transparency sheet. Both these forms have their respective uses.

The continuous roll

Every OHP has a provision for winding an acetate roll sheet from one end to the other. Therefore, if needed, you can insert a blank acetate roll from one end of the OHP. To move this roll from one end to the other, you can use it as a substitute of blackboard/chalkboard. This form is more useful to a teacher who prefers to create/develop display of instructional materials instantly along with the teaching-learning process. This type is preferable for calculation, derivations, and other similar subject areas. This form is preferable to the
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blackboard/chalkboard as there is no need to rub off any of the material at intervals caused by lack of space as it sometimes happens on the blackboard. This also protects your hands and clothes from chalk dust. In an OHP you can insert a big acetate roll that will suffice for the whole lecture. Besides this, you can sit while you teach, if you prefer so.

The single transparency

Previously, thin sheets were available for making OHP transparencies. These sheets had a tendency to curl up. Therefore, such transparencies were fixed on a plastic or cardboard frame. Such transparencies were called mounted transparencies. Now-a-days, one gets sheets which are thicker and less prone to curling. Therefore, mounting, which takes up a lot of space and time, is not necessary. Now-a-days, storing these thick transparency sheets in their blank boxes is quite common, as they are very handy to store and to carry. While storing however, it is advisable to keep some blank sheets of paper in between two transparencies to ensure that they do not stick to each other.

Although single transparencies are also used for creating the supportive display material simultaneously with lecturing in a classroom, it is advisable to use them in the production of prepared instructional material. In the coming paragraphs, the design and production of a single OHP transparency are discussed at length.

Design and preparation of an OHP transparency

An OHP transparency can be prepared by a number of methods but the basic steps for its preparation, remain the same in all the methods.

i) Drafting: Generally all the supplied blank acetate sheets are larger than the top glass frame of OHP. Thus, some standard measurement area should be decided first. The marking of the area avoids the cutting of the material on projection. One of the simplest methods is to prepare a draft. For this, cut out a square shaped thick white card of suitable size, and mark the effective outline of the OHP platen, using a blackfelt pen or marker. This can be used as the work surface and guide for preparing the future transparency sheets. The acceptable space for a grid is square. The grid can be easily produced manually. It is also helpful to stick two small pieces of Blue-tack or similar rubber adhesive to the top edge of the card as shown in the Figure 6.6. These pieces of Blue-tack hold the acetate sheet firmly in place while you work on it.

![Fig. 6.6: A Home-made Work Surface for the Preparation of OHP Transparencies](image)

ii) Production of OHP transparencies manually: This is another simple and quick way of producing an OHP transparency. In this either water-soluble or permanent marker pens are used for writing/drawing. The use of the specific type of pen depends upon the content. If a transparency is to be re-used, it is preferable to use medium-tipped spirit based pens rather than water-soluble pens. Black, red, blue and green are the preferred colours because they get reflected better on the screen. If a large coloured area is to be
shown, the use of a colour transparency in that shape is advisable.

Written material should be presented in writing or printing style. This enhances legibility to the optimum level. The smallest lettering to be used on a transparency should be quarter of an inch, allowing for normal viewing and lighting condition. Lettering also varies from situation to situation. Generally, type-written letters are avoided due to their distress-causing nature. Generally capital forms are preferred for short titles and emphasising points, and running printing style for the other matter.

A gap of roughly 1/4" is advisable in between lines and proper spacing should be used in between the words. For producing fine quality in the finished product, machine-generated lettering is required. Generally for most purposes, hand produced lettering is perfectly adequate and much quicker.

iii) Typing OHP material: This is also a popular method of producing OHP transparencies. For this, instead of a standard office typewriter a bulleting or primary typewriter using a special ribbon or carbon sheet is used to type the material on to the acetate sheet. The second way is to type the material on to a paper and make a transparency from this by using a thermal copier.

iv) From opaque originals: We can also prepare an OHP transparency from opaque originals. By this method, good transparencies are produced if the original material is suitable for OHP projection, by using a thermal copier or similar machine.

v) From computer-generated originals: Today, it has become possible to design and prepare OHP transparencies with the help of a computer.

You are able to provide gainful learning experiences to the students by using OHP displays according to the demands of the teaching-learning situations. There are three major display techniques by which you can display your still visual aids by using an OHP. These are:

a) Progressive disclosure: This is one of the basic and most useful techniques from an instructional point of view. In this technique, the transparency is totally covered with the help of a paper, or pieces of paper – like opaque material. You can reveal the portion progressively as the classroom teaching goes. This has the dual advantage of concentrating the mind of the learner on whatever item or section is being discussed, and retaining their interest by keeping them in suspense about the next point (a good psychological ploy). There are other modern and versatile methods of displaying this technique.

b) User of overlays: This is also a very useful method. In it, the whole transparency is displayed. As the teaching process progresses, other transparencies are placed over the first transparency. With the help of this technique a complicated process can be explained in a very simple manner by superimposing transparencies. This technique is useful for explaining complicated processes/systems.
c) Use of animation: An OHP is able to project animation to a certain extent. Ripple tank is one such example. It is made up of a transparent sheet. By placing this tank on the platen and projecting a light, characteristics of wares can be explained in a very simple way. In another way, special polarising materials are placed on the platen.

6.5.5 Computers

Though some of us have no access to the use of computer in instruction at present, the future years must certainly see a massive use of computers in instruction. As a communication aid, it has a lot of potential which can be exploited for instructional purposes, especially in the field of individualised instruction. As teachers, we must know the role of computers in the teaching-learning process. A computer can record, analyse and react to students' responses, it can store and manipulate information on an extensive scale, it can control and manage a wide variety of learning materials; and it can simultaneously cope with the learning requirements of many individuals. It can make a number of planning decisions also.

Technical description of a computer

A computer is an electronic device that accepts data, performs operations on that data in a sequence (decided by a programme) and outputs the results. Computers can be of various sizes and termed differently like mainframe computers, mini-computers and microcomputers. Apart from size, computers are differentiated according to specifications of the electronic devices. These include the amount and type of storage, the capabilities of the Central Processing Unit and the type and nature of the peripheral equipment (such as disc storage) that can be connected to the computer.

The basic microcomputer system as shown in figure 6.8 consists of an input device (e.g., the keyboard), the Central Processing Unit of the computer and storage devices (e.g. Cassette tape player, floppy disc device), and the output device (e.g., a T.V. display Unit or a monitor and/or printing terminals). The actual equipment of the computer system is called the Hardware, while the term Software refers to the instructions or the programmes that the computer carries out.

The input device, usually a keyboard, (or cassette recorder or disc device), is meant to send data and instructions to the Central Processing Unit. The control unit in the CPU receives the instructions involving calculation or comparison. It then controls the movement of data from the memory to ALU for the arithmetic or logical operations. Once these operations are over, it moves the results to a specific storage location and/or to the output device. Normally, a television screen displays the work that the computer has done. A printer can also be used if a hard copy is required.

![Diagram of Microcomputer System](image-url)
Role of computers in instruction

A computer has several applications in instructional situations. It is used to find the entry level of students' knowledge on enrollment. It is also used to plan and print individualized programmes, monitor a student's progress and compile tests and scores. But the most important contribution of computer in the domain of instruction is Computer-Assisted Instruction (CAI) and Computer-Managed Instruction (CMI). Here, we will tell you about the different modes of computer-assisted instruction and their advantages and disadvantages.

Computer-assisted instruction

In computer-assisted instruction, there is flow of information and interaction between the computer and the learner. The computer delivers instructions directly to students and allows them to interact with it through the lessons programmed in the system. A computer provides feedback to the learner on the basis of his/her performance. On the whole it may be said, that the computer acts as a teacher to the student.

In order to carry out this teaching/learning function, a computer utilises various instructional modes. Let us now discuss these modes in brief.

1) **Drill and practice**: In this mode, a computer presents the learner with a series of exercises which he or she must do by giving some response. It provides the learner some feedback about the answer in the form of a congratulatory message if it is right, or a corrective comment if it is wrong. Thus, computer-assisted instruction provides endless drill and practice with repetition at a pace that can be controlled by the learner. The computer proceeds only when mastery is achieved by the learner.

ii) **Tutorial mode**: In the tutorial mode, as in programmed instruction, information is presented in small units followed by a question. The student's response is analysed by the computer and appropriate feedback is given.

iii) **Simulation mode**: Learning experiences regarding real life systems of phenomena are provided to the learner through this mode. For example, the study of genetics, experiments in town planning, the operation of a system, etc., can be shown to the student through simulation in the computer.

iv) **Discovery mode**: This mode uses inductive approach to learning wherein the problems are presented and the learner solves them through trial and error.

v) **Gaming mode**: In gaming mode teaching can be imparted, through a play way mode.

Computer-managed instruction

In computer-managed instruction (CMI) the computer gathers, stores, and manages information to guide students through individualized learning experiences. The computer helps the student to move through check-points (in the form of definite activities) in the education process at different times via different paths matching the individual capabilities. It achieves this individualised instructional process by a series of activities-administering diagnostic tests, scoring them, prescribing the appropriate paths and monitoring the progress of individuals all along the route.

Check Your Progress

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<td>a)</td>
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</tr>
<tr>
<td>5.</td>
<td>Which of the following is untrue of slides but true of filmstrips?</td>
</tr>
<tr>
<td>a)</td>
<td>They are used to project micro-specimens, diagrams, graphs, illustrations, etc.</td>
</tr>
<tr>
<td>b)</td>
<td>They have a continuous movement on the screen.</td>
</tr>
<tr>
<td>c)</td>
<td>They can be prepared by photographing objects, pictures, etc.</td>
</tr>
<tr>
<td>d)</td>
<td>They can be prepared with the help of a computer.</td>
</tr>
<tr>
<td>6.</td>
<td>Which of the following is not observed while using an Overhead Projector?</td>
</tr>
<tr>
<td>a)</td>
<td>Platen and head lens surfaces are kept clean and free from dust.</td>
</tr>
</tbody>
</table>
b) The screen is kept in one corner of the front corners of the classroom.
c) The lamp is switched on first and then the blower.
d) It should not be used for a long time.

7. What are the instructional applications of a computer?

6.6 AUDIO-VISUAL PROJECTED (WITH MOTION) MEDIA

Audio visual projected media include motion picture, film, television, CCTV, computer, slide tape presentation, interactive video, etc.

6.6.1 Motion Picture Film

A motion picture (sometimes called a movie or film) is a series of still pictures (frames) usually 8 mm or 16 mm in size, taken in rapid succession. When projected by a motion picture projector, they give an illusion of motion (Gerlach and Ely, 1980). Films vary in length from one minute or less to 50 minutes or more. If a 16 mm motion picture is more than 50 minutes in length, it is usually stored on two or more reels. The speed at which a film is projected varies with the format of the film. A sound 16 mm film is projected at 24 frames per second (fps), and super 8 mm films at 18 fps. Therefore, it is possible to show films in such a manner as to create three types of images: 1) normal motion, 2) fast motion or 3) slow motion.

Motion picture films are very useful in teaching various subjects. They are very effective in teaching literature, drama, history and geography and science subjects. Motion pictures motivate
the students as they enjoy the medium. They bring people, country, events, etc. on the screen.
However, they are expensive and subject to damage if used extensively.

6.6.2 Instructional Television

This includes image magnification facilities, video taping and replaying and the open TV system run by universities or school campuses. Surgery skills in medical colleges, laboratory skills and workshop skills can be taught through instructional television. Instructional television uses open TV systems. Thus, we have UGC’s countrywide classroom programmes on Higher Education which are telecast over the National Network. State Institute of Educational Technology (SIET) in six States and the Central Institute of Educational Technology (CIET) produce educational TV programmes for the children. These programmes are produced in local language and telecast through a communication satellite.

We will discuss more on television and video programmes in Unit 10 under Block 3, i.e. Application to Audio/Video Programmes.

6.6.3 CCTV

Close Circuit Television or CCTV is a form of instructional television. In CCTV, signals are received by the receiver through cable. Therefore, its range is limited to the length of the cable. It is very useful for teaching a large group of students. It is used in medical colleges. When an operation is being conducted, it is not possible to accommodate all students in operation theatre. Through CCTV, students are shown the operation in various rooms. Hence, it increases the range of instruction to one or more locations beyond the classroom. It magnifies exhibits and demonstrations which are not possible in a classroom situation.

6.6.4 Slide Tape Presentation

In slide tape presentation, slides replace the filmstrip and are used in sequential conjunction with correlated recordings in cassette tape. Slides are prepared according to the need of the content to be presented and the students’ entry behaviour. Any particular slide may be deleted and a new one added according to the need of instruction. Slide tape presentation is very useful in teaching as it includes both sound and visual.

Students take keen interest in such type of presentations. The teacher, with a little training, can use the tape recorder with ease and effectiveness. The teacher can record his commentary with appropriate background, music and sound. For example, if a sea is shown in the slide, the roaring sound of tides may be given in the background music. The final recording is made with the teacher’s commentary along with the background music and sound effects on two tape-recorders. The mixed recording of the final tape is done on a third recorder.

6.6.5 Interactive Video

Interactive video, an innovation in educational technology, is getting popularity day-by-day because of its dual functions of providing video pictures and computer-assisted instruction. Thus, interactive video makes use of the existing technologies of video and computer-assisted instruction and thereby provides all the advantages of the two media as well as an effective interaction between them.

Technical description of an interactive video

In an interactive video system, the video medium can be either video disc or video cassette and interaction with the system is provided by an interface to a microcomputer. A lesson generally runs under the control of the computer programme. The computer controls all the normal functions of the video machine like play, fast forward, rewind, still frame, search etc. Usually, the same monitor is used by the computer and the video. As a result, a student can at a point of time see a video picture or computer display although an overlay of computer output over the video picture can be done.

As we have already seen in case of computer-assisted instruction, interactive video also uses the principles of programmed instruction in structuring teaching-learning sequence. Laurillard (1987) describes teaching-learning sequence in an interactive video in the following way:
"Video presentation (5-10 minutes):
Computer displays question relating to video sequence;
Student types in answer; computer checks it; if correct, computer outputs 'correct' message,
then plays next video sequence; if incorrect computer outputs 'incorrect' message, then
either plays a remedial video sequence or branches to a remedial computer sequence then
finishes with another test question."

**Advantages of interactive video**

i) The advantage of interactive video is that the amount of information immediately available
is enormous because of the immense storage capacity of a video disc. A single video disc
can even store the entire Encyclopaedia Britannica.

ii) It has the potential to present text, graphics, graphics film and sound in varied ways.

**Disadvantages of interactive video**

Because of its high controlled nature, learners have hardly any choice over the order of
presentation of the material, or the tests. Thus, they cannot follow up their interests and
queries as they arise. In consequence, learning may become mechanical rather than meaningful.

Inspite of some difficulties, interactive video may turn out to be the educational technology
of the coming years.

**Check Your Progress**

**Notes:**

a) Write your answers in the space given below.
b) Compare your answers with the one given at the end of the unit.

8. Instructional television can be used for:
   a) Skill development
   b) Emotional development
   c) Intellectual development
   d) Social development
   e) All of the above

9. What is not true of interactive video?
   a) Presentation of video pictures
   b) Presentation of CAI materials
   c) Use of principles of programmed instruction
   d) Learning becomes meaningful rather than instructional.

### 6.7 LET US SUM UP

In this unit, we discussed four categories of instructional media, namely, audio media, visual
non-projected three-dimensional media, visual projected (still) media, audio-visual projected
(with motion) media. Under audio media, four media, namely, human voice, grammophone
recording, tape recording and radio were highlighted.

Under visual non-projected three-dimensional media, we presented to you models, mock-ups,
diorama, maps and globes, puppets and holograms. Most of these media could be prepared
by teachers and make use of in teaching-learning process. Under visual projected (still) media,
we touched upon slides, filmstrips, microfilm, microfiche, overhead projector and computer.
We discussed how to prepare OHP transparencies and how to organise computer-assisted
instruction (CAI).

Under audio-visual projected (with motion) media, we described about motion picture film,
instructional television, CCTV, slide tape presentation, interactive video. We highlighted the
instructional values of all these media.
6.8 UNIT-END ACTIVITIES

1. Select a topic of your own choice. Prepare OHP transparencies on that topic. Teach the topic to your student using OHP transparencies. Assess the impact of the use of OHP transparencies in your teaching.

2. Prepare some models which could be of use in your teaching activities.

3. Visit the computer training centres in your city. Find out what training packages they have.

6.9 ANSWERS TO CHECK YOUR PROGRESS

1. Human Voice

2. Radio is called a mass medium because it reaches the large section of the population of a country at the same time.

3. There are three instructional uses of models:
   a) They are used as visual support materials in instruction
   b) They are used as objects for study or manipulation in individualised learning.
   c) They are used as construction project for individuals, small groups or even the entire class.

4. Political maps show the political division of countries, provinces, etc., whereas historical maps show the boundary of a particular empire, treaties, etc.

5. b)

6. c)

7. There are two major instructional applications of computer. One is computer-assisted instruction and the other is computer managed instruction. In computer-assisted instruction, the computer provides the lesson to the learners, interacts with them, gets responses from them and provides feedback to them. On the other hand, in computer-managed instruction, the computer gathers, stores and manages information to guide students through individualised learning experiences.

8. e)

9. d)

6.10 SUGGESTED READINGS


