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# UNIT 12 MEDIA SELECTION AND INTEGRATION

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## 12.1 INTRODUCTION

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In Block 2, we introduced you to a variety of media which are used in the teaching-learning process. The knowledge of various media helps a teacher while transacting learning experiences. Sometimes, it is very difficult on the part of a teacher to judge which medium out of an array of media is the best for a given instructional task. Hence, comes the importance selection of media and their integration in the instructional process. In this unit, we will focus on why and how various media are used in the teaching-learning process.

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## 12.2 OBJECTIVES

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After going through this unit, you will be able to:

- discuss the importance of media in the instructional process;
- point out the need of media selection;
- discuss the factors affecting media selection;
- define media integration in the context of instructional process;
- point out the need of media integration;
- differentiate between multiple and multi-media.

## 12.3 MEDIA AND INSTRUCTIONAL PROCESS

We have discussed the concept of instruction and the instructional process in Block-1, ES-331 'Curriculum and Instruction' of the B.Ed programme. In this context, we recapitulate what is meant by Instructional Process and the role and importance of media in this process.

Instruction is a process of providing a controlled environment consisting of various components with which learners interact and gain experience, leading to the attainment of certain prespecified learning outcomes or instructional objectives. The components which constitute instructional environment are (a) content or learning experiences; (b) teacher or provider of learning experiences; (c) methods and media which are means of providing learning experiences; (d) learner is also a part of this instructional environment when learning takes place. Let us look at Figure 12.1 and understand how learning takes place.

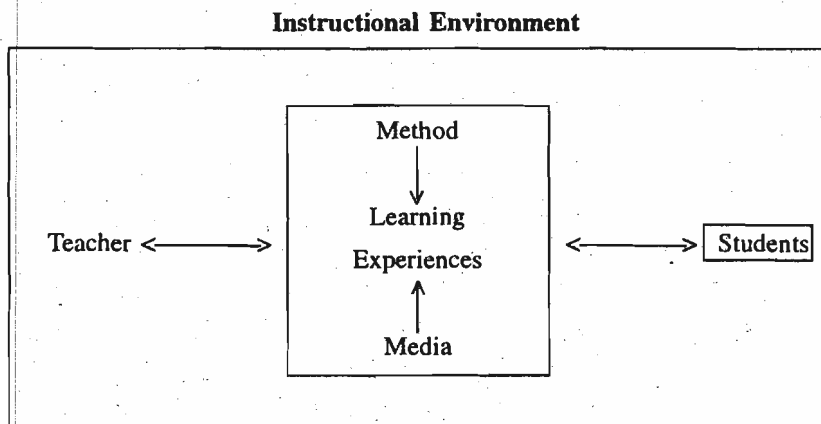


Fig. 12.1: Components of an instructional Environment

The main aim of carrying out any instructional activity is to provide learning experiences to the learners. To carry out those activities, a teacher decides instructional objectives, identifies learning experiences, transacts these learning experiences in an instructional environment and evaluates the attainment of instructional objectives or learning outcomes by the learner. Transaction of learning experiences means transaction of a given content. In order to transact a given content, a teacher takes the help of some methods. These methods may be teacher controlled, learner controlled or group controlled methods. A teacher can use teacher controlled methods like lectures, demonstrations, learner controlled methods like PLM, project work, library work, etc. or group controlled method like debates, discussions, seminars, panel discussions, etc. Through all these methods a teacher attempts to provide direct learning experiences. A teacher can give a learner direct experience with the objects of instruction. When he/she wants to illustrate something about objects or processes, he or she can perform a demonstration using the actual objects and communicate orally the points he or she wishes to make. For example, he or she can teach compounds and mixtures to high school students by mixing up different chemicals. (refer to Unit 7 in Block 3).

This use of various methods, techniques alone does not help a teacher in the transaction of learning experiences. There are many events of instruction which require use of several media — audio, visual and audio-visual. For example, it is too difficult or expensive in many cases to have actual objects under study in the classroom. Hence, a teacher often selects a visual medium to represent the objects, either photographs or figures. The learning experience provided through media, thus, becomes mediated experience. Each medium is effective for specific learning tasks and with specific learner groups. Thus various media make certain types of learning tasks easier. In other words, various media facilitate a teacher in the transaction of learning experiences.

## 12.4 NEED OF MEDIA SELECTION

From the above discussion, it is clear that media have an important role in the instructional process. But, all media are not suitable or appropriate for all types of instructional tasks. Each medium has its own capabilities or attributes. Attributes are pictorial representation, Size (enlarged, reduced or real), Colour (black and white, limited colours, full colours),

Movement (still, semi-motion, full motion), Language (print or oral sounds) and Sound-picture relationship (silent or with sound). Each instructional task also requires media with specified characteristics or attributes. It is, therefore, considered that media selection is an important part of instructional design and delivery. But it is very difficult on the part of a teacher to judge which medium out of the available media is the best for a given instructional task. A teacher, therefore, takes into consideration various factors which affect media selection for the transaction of learning experiences.

### Check Your Progress

Notes: a) Write your answers in the space given below.

b) Compare your answers with those given at the end of the unit.

1. What are the constituents of an instructional environment?

.....  
 .....

2. What is the need of selecting media for instructional purposes?

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 .....

## 12.5 FACTORS AFFECTING MEDIA SELECTION

There are many factors as well as approaches of selecting media. The simplest approach is the use of whatever media are available with a teacher. He/she can pick up any of these available media for carrying out a teaching activity. But sometimes, it is felt that some media are inappropriate for some objectives. It means that we reject these media and select others which are appropriate for our instructional objectives. This approach is called '**Selection by Rejection**'.

Although these are some examples of media selection, there are definite factors which govern the process of media selection.

While selecting media for instructional purposes, we are generally concerned with questions like, (a) What instructional methods are we adopting? (b) What are the learning tasks we are going to provide the learners? (c) What are the special characteristics of the learners? Apart from these basic concerns, there are also other factors which contribute to the media selection. Do the teachers and the learners have favourable attitude to the medium going to be used for instructional use? What is the cost of the medium? Is it user friendly? Does the medium effectively communicate

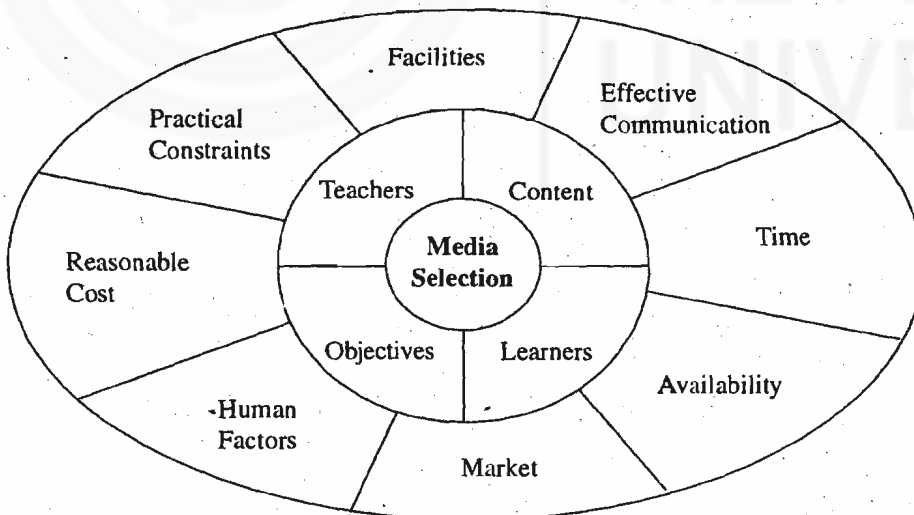


Fig. 12.2 : Factors affecting the process of media selection

Source : Romiszowski, 1981.

the message? Is it available as well as accessible to the teacher and students? Questions such as these have to be taken into consideration in the selection of media. Several authors have given different models of media selection. Among them the model given by Romizcowski (1981) is widely quoted. His model covers most factors of media selectio

All the factors which contribute to the media selection may be categorised into the following:

1. Pedagogical Utility
2. Human Factors
3. Availability and Accessibility
4. User Friendly
5. Cost
6. Effective Communication
7. Infrastructural Facilities
8. Time
9. Hardware

### 12.5.1 Pedagogic Utility

This factor is concerned with two aspects: First, the instructional objectives to be achieved at the end of the instructional process. Second, content or learning experiences to be transacted during the instructional process. Instructional objectives mainly pertain to three domains of Bloom's Taxonomy of objectives. These are: Cognitive Domain, Affective Domain and Psycho-motor Domain. Content includes concepts, facts, figures, principles, procedures, propositions, attitudinal changes, skill development, etc. Therefore, a teacher has to identify media in terms of the content he/she wishes to provide to students for the intended instructional objectives. Let us examine various media which can be used for furthering learners' development in each of these domains.

Cognitive Domain (Factual information, visual identification, concept formation, principle/rule learning, learning procedures, etc.)

- Chalkboard, Marker board
- Drawings, charts, maps, flip-chart etc.
- Print-textbooks, short readings manuals, workbooks, handouts, articles etc.
- Model, real objects, simulators
- Slides, filmstrips
- OHP transparencies
- Individualised instruction through CAL/CAI, audio tape etc.
- Live instruction—through classroom lecture, demonstration
- TV and CCTV
- Video tape and Film
- Telecast and Broadcast
- Interactive - video
- Teleconferencing
- Computer Conferencing

Affective Domain (Development of attitudes, interest, opinion, motivation etc.)

- Chalkboard
- Flip-chart
- TV, film and video tape
- Audio tape
- Telecast and Broadcast
- Slides/Sound
- Live Instruction—classroom lecture, demonstration
- Simulation and Role-play
- Telephone teaching
- Audio-Video conferencing
- Computer conferencing

- Live classroom demonstration
- Drawing, paintings
- Model, real object
- Chalkboard drawings
- Audio tape—skills through listening
- Film/TV/Video tape — for demonstration of processes leading to skill development
- Language laboratory for developing auditory discrimination and listening comprehension
- Computer simulation/animation, CAL/CAI, computer conferencing
- Audio and Video conferencing.

Apart from instructional objectives, selection of media is also governed by the kind of learning experiences or content knowledge a teacher wants to provide his/her students. For example, most media can handle abstract knowledge, but there are some such as television that are excellent for representing concrete knowledge. Media also differs in the extent to which they can help to develop different skills. This is related to the control characteristics and the representation features of the medium. For example, television, videos and computers are excellent media for imparting skill education. A teacher therefore, requires a good understanding of what is required to teach a particular subject, confined with knowledge of the pedagogic strengths and weaknesses of different media. Rowntree (1994) has given a chart which suggests the more common media might best enable your learners to perform a given learning task.

Chart

Which media might best do what?	Media									
Tasks	Pt	au	vi	ct	cs	mi	cc	le	ff	tt
Provide a carefully argued analysis.	x	x						x		
Convey sights, sounds and spirit of subject.			x	x		x	x			
Build learners' ideas into the teaching.					x		x		x	x
Ask learners to answer questions about subject.	x	x	x	x		x	x		x	x
Enable learners to try things, out physically.					x					
Ensure learners to get physical feedback from real world.					x					
Give learners standardized verbal feedback.	x	x					x			
Give each learner a unique personal feedback.								x	x	x
Continuously alter teaching to suit each learner's needs.									x	x
Provide learners with a record of the learning experience.	x							x		

Key: pt = print; au = audio; vi = video; ct = computer tutoring; cs = computer simulation; mi = multimedia; cc = computer conferencing; le = lecture; ff = face-to-face tutoring; tt = telephone tutoring.

(Chart adapted from Rowntree, D. *Preparing Materials for Open, Distance and Flexible Learning*, Kogan Page, London, 1994).

**Check Your Progress**

Notes: a) Write your answers in the space given below.

b) Compare your answers with those given at the end of the unit.

3. Which of the following is best suitable for the development of affective attributes?
- OHP transparencies
  - Charts
  - Maps
  - Audio tape
- .....
4. Which of the following provides a carefully argued analysis?
- Computer conferencing
  - Telephone tutoring
  - Lecturing
  - Face-to-face tutoring
- .....

**12.5.2 Human Factors**

Human factors related to the selection of media are the teacher who uses media for teaching purposes and the learner who uses for learning purposes. So far as a teacher is considered he/she should have favourable attitude towards the use of media in teaching-learning process. Some teachers are very comfortable with certain media, while they find difficulty in others. All this are due to lack of proper orientation or training of the teachers in the use of various media. Hence, a teacher's attitude and orientation in media compels him/her to select one medium or other.

Similarly, learner factor also plays a great role in media selection. Learners bring to every instructional situation a set of capabilities for learning. These include prior information about the particular subject and basic intellectual skills to decode and process the new material. Learners interact in many ways to influence the choice of media. For example, learners with low ability are more benefited from a highly structured mediated instruction, whereas learners with high ability are profited from unstructured presentation in which they can control the presentation and construct meaning of the material (Johnston, 1987).

**12.5.3 Availability and Accessibility**

Whenever a teacher decides to use any media for instructional purposes, he/she should consider their availability both inside and outside the institution. In schools, there are learning resource centres. These resource centres are equipped with various teaching and electronic media. The teacher can make sure that the intended media are available there. If not available, he/she should explore the possibility of their availability outside the institution. Sometimes, certain media may not be available to a teacher. In such situations, the teacher can look for substitutions. For example, the book substitutes the age-old teacher, a TV programme substitutes a film. Therefore, the teacher should not be desperate if a particular medium is not available, but think of alternatives to achieve the desired objectives.

Very often the availability of media even does not ensure selection of media. Available media should be accessible to the users. Accessibility means that the teacher is able to access the media for teaching purpose and the learner for learning purpose. Now-a-days, many schools are provided with televisions and computer sets. Though they are available in schools, they cannot be accessed either by teachers or the learners due to some reason. For example, the head of the institutions may not allow others to use their gadgets.

Now-a-days many students are enrolled in National Open School and State Open Schools to complete secondary and higher secondary education, Open schooling which follows distance education methodology uses multi-media approach that includes different media. Students of this system must have access to their media either at home, or in a local study centre dedicated to open learning, or at a local public institution that shares its facilities, or at their place of

work. Therefore, availability and accessibility to both teachers and learners are two important considerations for media selection.

### 12.5.4 User Friendliness, Control and Interactivity

Media should be easy to operate and handle by their users. The operations of media should not be so complex that the users have to depend on technical people for their management. Many a times, it so happens that even if someone is interested to use certain media, he may not be able to use it because handling of media requires technical experiences. In other words, media to be used should be friendly with the users.

The users, namely, teachers and learners, must have control over media. Suppose a learner is learning-receiving messages transmitted through a textbook or an audio tape or through slides where he can adjust the speed of reading according to his needs, or stop the presentation, repeat it again, etc. The user should be able to control media according to requirements.

Similarly, a teacher can make use of media like audio tape, video tape or computer programmes in his/her teaching and control the media according to the requirements during teaching. Learners do have more control over permanent media like books, cassettes and computers than over ephemeral media like lectures or broadcasts. This control enables learners to learn from media more effectively.

Interactivity means the ability of the learner to respond to the media and obtain feedback on the response. This enhances student learning to a great extent. There are two kinds of interactivity:

**Learning material interactivity:** This means learner interacts with the medium, gets feedback from it and the medium accommodates learners own input and direction.

**Social interactivity:** Learners interaction with teachers and with each other via the medium. For example, in teleconferencing, learners situated in different locations interact with each other through this new technology.

### 12.5.5 Cost

Cost or affordability is an important consideration in media selection. The instructional objective for an instructional task may be achieved with the help of alternative media. But, the choice of media depends on how much the user can afford to get such media. For example, a teacher can buy/rent a film on how Indian Parliament functions provided he/she has the budget to do that. Otherwise, he/she has to depend on the print medium. Costs related to media are capital costs, production costs, recurrent costs and variable costs. Here is a brief look on what these costs are and how they affect the budget:

1. **Capital Costs:** Capital costs are initial expenditure the institution incurs for the establishment of either a studio or a computing network or obtaining necessary hardware equipment.
2. **Production Costs:** These costs are related to the production of instructional material. Production costs vary from one instructional material to another. Fixed costs for one hour of instructional material has been estimated as follows:
  - Face-to-face lecture 1 unit
  - Audio cassette/Radio/Teleconference 2 units
  - Televised lecture 2-5 units
  - Computer-mediated communication 2-5 units
  - Print 2-10 units
  - High-quality television programme 20-50 units
  - Pre-programmed computer-based learning 20-50 units
  - Computer-controlled video disc 50-100 units

(Units give a comparative picture of production costs)

Source: COL Kit 2 (1997).

3. **Recurrent Costs:** These costs are required to maintain and manage media. For example, teleconferencing requires a high cost of maintenance because the production staff is required to operate the equipment.
4. **Variable Costs:** These costs are linked with the increase or decrease in the use of media. For example, if the audio cassettes are used by many people, their costs come down.

Audio cassettes and radio have low fixed and low variable costs whereas broadcast television has high fixed cost and low variable costs.

### 12.5.6 Effective Communication

Effective communication is the most important factor in the process of media selection. While selecting any media, one has to look into the fact that the medium selected is able to communicate the intended message or information effectively. If the medium does not communicate the message effectively, use of such medium in the instructional process is meaningless. For example, while teaching growth of population in India during the five years, you use a bar graph. The bar graph should be able to clearly convey the information regarding the growth of population during the last five years. Therefore, the teacher should take enough care to produce the medium so that it communicates effectively.

### 12.5.7 Infrastructure Facilities

Use of media for teaching-learning activities requires adequate infrastructure facilities. Infrastructure facilities like table, chair, electric supply etc. should be available in the classroom or any specific place where media are to be used. For example, while using OHP in your teaching, you must ensure that the classroom has a table on which the OHP can be kept. There should be electric power point for supplying electricity to the OHP. There also should be a white surface or a white screen on which the projection can be made.

### 1.2.8 Time

Time is a great factor in the selection of media. As all of us know, there is a fixed time for any class which may range from 35 minutes to one hour. While selecting any media, instruction for a teacher has to look into how much time a medium requires for better presentation. For example, in a class period of 35 minutes, a teacher earmarks 10 minutes for the use of an audio programme. If, he/she gets the audio programme of 10 minutes, he/she can fruitfully use the programme in his/her teaching. But instead if he has a film of two hours duration he would not be able to show it to the classroom at that stage. Therefore, the teacher has to take into account the time factor in the selection of media.

### 12.5.9 Hardware

Now-a-days most of the educational technology hardwares are in the form of electronic gadgets. We all know that innovations are always taking place in all types of electronic gadgets. As a result, we happen to get more sophisticated gadgets from time to time. Hence, it is important that while selecting any educational technology/hardware a teacher should look into certain aspects. The media selected should be safe and durable. They should also be compatible with the existing equipment. If you go for any sophisticated media, you should ensure that adequate maintenance service along with spare parts of the gadgets are easily available in the market. Moreover, the gadgets should be appropriate for the geographical and climatic conditions.

#### Check Your Progress

Notes: a) Write your answers in the space given below.

b) Compare your answers with those given at the end of the unit.

5. How does availability and accessibility affect the selection of media?

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 .....  
 .....

6. How does cost determine media selection?

.....  
 .....  
 .....



## 12.6 HOW TO SELECT MEDIA ?

In the previous section, we discussed various factors which are considered while selecting media for the instructional purposes. Once you are clear about the various factors, you need to know the steps involved in the selection of media. There are four steps in the selection of media. These are:

1. Write an objective.
2. Determine the domain in which the objective can be classified: Cognitive, Affective, Psychomotor.
3. Consider various factors affecting media selection.
4. Consider various methods/techniques to be adopted.
5. Select appropriate media.

### 12.6.1 Write an Instructional Objective

The first step in the selection of media is to write an instructional objective. A good instructional objective has four distinguishing characteristics. These are:

1. It describes something which the learner performs or produces.
2. It states an observable behaviour or a product of the learner's behaviour.
3. It states the conditions under which the behaviour is to occur.
4. It states the standard which defines whether or not the objective has been attained.

Let us examine the following objective in terms of the above mentioned characteristics:

**Instructional Objective:** A trainee will be able to type out 40 words per minute without any mistake.

In this example:

- |                         |   |                      |
|-------------------------|---|----------------------|
| 1. Learner performs     | - | Typing out           |
| 2. Observable behaviour | - | Typing out           |
| 3. Conditions           | - | Without any mistake  |
| 4. Standard             | - | 40 words per minutes |

### 12.6.2 Determine the Domain in which the Objective can be Classified: Cognitive, Affective, Psychomotor

Once you have specified or written the objective, you determine the domain in which the objective can be classified. The example of instructional objective which we have given earlier belongs to psychomotor domain as the trainee is expected to type out 40 words per minute which is a **psychomotor skill**.

### 12.6.3 Consider various Factors Affecting Media Selection

At this step, you are expected to consider the various factors of media selection in terms of the written objective. Looking at the earlier example, you can think of various media. Out of the available media, a video programme depicting a typing skill is more appropriate. A learner can get command over the video programme. He/she can learn the typing skill on his/her own by switching on and switching off the video programme and then actually practicing on a typewriter.

### 12.6.4 Consider various Methods/Techniques to be Adopted

At this step, you are required to consider various methods/techniques to be adopted. We have discussed about methods and techniques in ES-331 i.e. Curriculum and Instruction. For example, you are following the lecture method to discuss a new concept. In this case, you can think of using OHP transparencies to support your main points in the lecture; even summarising whatever you have discussed in your lecture. In the illustration of typing which we gave earlier, you can think of demonstration as method. For that, you may choose a video programme which demonstrates the typing skill. Hence, decisions of methods/techniques also determine the process of media selection.

### 12.6.5 Selecting the Media

After comparing the appropriate need of different media, you can select the media. In this case, the video programme depicting typing skill is selected to help practice the method on a typewriter.

## 12.7 MEDIA INTEGRATION

In the earlier sections, we have discussed that each medium has some instructional value or the other. Therefore, use of a single medium cannot fulfil the requirement of any instructional activity. Various media have to be used in combination. Although one of the media could be the 'Master Medium', other media should be used so that the quality of presentation becomes maximally effective. Media also can be combined with appropriate methods so that instructional activity becomes effective. Let us take an example of a class on geography wherein the teacher teaches about "Environmental Pollution". The class period is 40 minutes. He divides the class 40 minutes as in Table 12.1.

Table 12.1: Example of Media Integration on the topic "Environmental Pollution"

Teacher's Activities	Media to be used	Time
Introduction to the Topic	Uses chalkboard and shows transparency. Uses lecture-cum-discussion method.	10 minutes
Teaching the main Content	Uses lecture-cum-discussion method writing on chalkboard or showing 4-5 transparencies.	15 minutes
Citing Examples	Showing a 10 minutes video sequence on "Environmental Pollution" or showing a set of 10 slides on "Environmental Pollution", or showing 10 pictures on the topic.	10 minutes
Summary	Explaining verbally or by showing a transparency or by writing on a chart.	5 minutes

## 12.8 MULTIPLE MEDIA AND MULTIMEDIA

In the previous sections, we discussed how various media can be integrated in teaching. When we integrate more than one medium into our teaching, we call it media-mix or use of multiple media or multimedia. But, due to the advancement of technology, one may not take the help of a number of media to be integrated with teaching. A single medium can consist of features of more than one medium. Such media are called multimedia. For example, the advanced computers are called Multimedia computer. These computers comprise text, data, sound, animation, visual, picture, graphics and interaction. Therefore, the use of a single multimedia computer in the instructional process fulfils the requirements of many media. The components of a multimedia is given in Fig. 12.3.

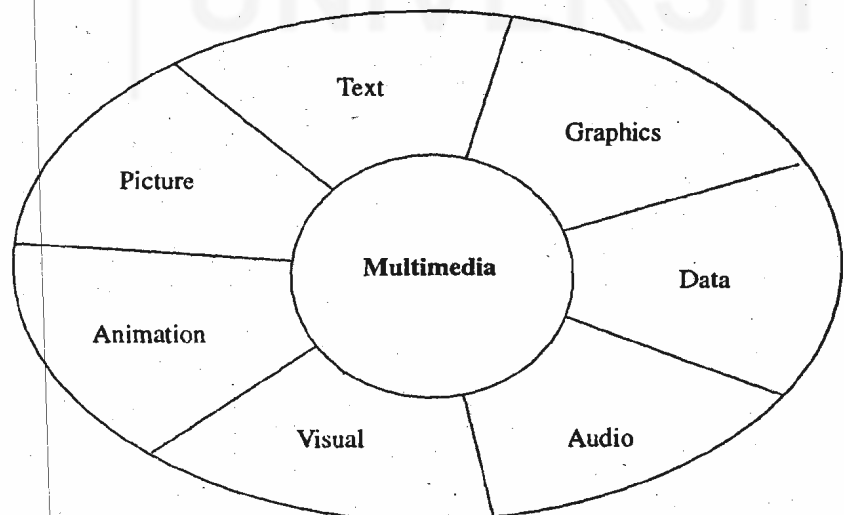


Fig. 12.3: Components of a multimedia

**Check Your Progress**

**Notes:** a) Write your answers in the space given below.

b) Compare your answers with those given at the end of the unit.

7. What are the various steps in the selection of media

.....  
 .....  
 .....

8. Differentiate between multiple media and multimedia.

.....  
 .....

**12.9 LET US SUM UP**

In this unit, we focussed on media selection and integration. In the beginning, we discussed the importance of media in the instructional process. Media constitutes an important component of the instructional environment. However, it is very difficult to decide which medium is the best for a given instructional task. Hence, one has to select media on the basis of several factors. These are pedagogic utility, human factors, availability and accessibility, user friendliness, interactivity, cost effective communication, infrastructure facilities, time and hardware aspects. We also mentioned the steps of media selection. We provided an example of media integration with instruction. We differentiated between multiple media and multimedia.

**12.10 UNIT-END ACTIVITIES**

1. Choose a topic of your choice. Analyse the content according to the media requirement. Select the media. Justify the basis of media selection.
2. Select and teach a topic of your choice with appropriate integration of method and media.

**12.11 ANSWERS TO CHECK YOUR PROGRESS**

1. An instructional environment comprises of a teacher, a learner, content or learning experiences, method and media.
2. Each medium has its own attributes and is not suitable for all kinds of instructional tasks. Hence, there is a need of selecting media.
3. (d)
4. (c)
5. Whenever we select any media, they should be available locally or in the school. Sometimes, some media are available in the school but are not accessible for use in the instruction activity, then such media cannot be selected. Therefore, both availability and accessibility of media are to be taken into account while selecting the media.
6. Cost determines the selection of media. While selecting media, a teacher should be aware of the cost of the media or how much he/she can afford to get the media. He should always select media which are within the school budget.
7. There are four steps in the selection of media. These are:
  - i) Write an objective.
  - ii) Determine the domain in which the objective can be classified: Cognitive, Affective, Psychomotor.

- iii) Consider various factors affecting media selection.
  - iv) Select appropriate media.
8. When we integrate more than one medium into teaching, we call it as multiple media or media-mix, but when a single medium consists of more features in media, it is called multimedia, for example, we have computers which serve the purposes of more than one medium.

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## 12.12 SUGGESTED READINGS

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1. Kulkarni, S.S (1986): *Introduction to Educational Technology*, New Delhi: Oxford & IBH Publishing Co.
2. Kumar, K.L. (1996): *Educational Technology*, New Delhi: New Age International.
3. Romiszowski, A.J. (1981): *The Selection and Use of Instructional Media*, London: Kogan Page.

