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Role Of Projected And Non- Projected Teaching Aids In Teaching Learning Process

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Abstract

Teaching method is one of the important elements of teaching learning process. A good teaching sometime fails due to non suitable method of teaching. In this era not only the new methods of teaching have been developed but also the methods of teaching are greatly affected by the development of new technologies i.e., computers, computer assisted instructions, projector slides and multimedia Today we are enjoying the benefits of science. Science makes our life very comfortable. Science benefited us in agriculture, transportation, exploration and all other fields of life. Audio visual aids are instructional devices in which the message can be heard and seen simultaneously e.g, television, video films, documentary films, etc. Audio visual aids help in stimulating the ears and eyes. Hence, in the strict sense a teaching aid is any device that can be used to help reinforce new information or skills. Instructional aids are devices that assist an instructor in the teaching learning process. Instructional aids are not self-supporting - they are supplementary teaching devices.

Keywords: Projected aids, Non Projected Aids

Introduction

Teaching aids are an integral component in any classroom. The many benefits of teaching aids include helping learners improve reading comprehension skills, illustrating or reinforcing a skill or concept, differentiating instruction and relieving anxiety or boredom by presenting information in a new and exciting way. Teaching aids also engage students' other senses since there are no limits in what aids can be utilized when supplementing a lesson.

As students are reading less and less on their own, teachers are finding reading comprehension skills very low among today's students. Teaching aids are helping teachers to close the gap and hone the reading comprehension skills of their students. Using magazine and newspaper articles, prints ads and even comic books are viable teaching

aids that assist in helping students comprehend text.

Teaching aids prove to be a formidable supplement for teachers when the reinforcement of a skill or concept is necessary. Not only do they allow students more time to practice, but they also present the information in a way which offers students a different way to engage with the material. Of course, this is important in order to reach the various learning types in the class.

As previously mentioned, it is important for teachers to reach all learners in a classroom. Therefore, the use of teaching aids facilitates this objective by assisting teachers in differentiating instruction. Using aids such as graphs, charts, flashcards, videos, provides learners with visual stimulation and the opportunity to access the content from a different vantage point. This gives each learner the opportunity to interact with the content in a way which allows them to comprehend more easily.

Teaching aids help to make the learning environment interesting and engaging. As we move toward a more digital society, kids are being exposed to technology and digital devices at a younger age. Video games and iPods are now what's exciting to students, so when they come to school they have little patience for lecture style teaching. Students are seeking constant excitement and simply have no tolerance for boredom. Teaching aids are improving the quality of education in today's schools while also providing students with the sense of excitement they desire.

Teaching aids are becoming the norm in the classroom. As traditional classrooms with blackboard and chalk become a thing of the past, and smart classrooms become the norm, teaching aids are growing in popularity and advancement. Blackboards are being replaced with white and smart boards. TVs are being replaced with LCD projectors and screens. And educators are becoming more focused on students growing with technology and integrating it into the curriculum. Students are making podcasts, videos and even creating web quests All of which are sound teaching aids to incorporate into the classroom.

Audio-visual aids are those sensory objects or images which initiate or stimulate and reinforce learning. These are very useful for effective teaching. With its help, there is effective communication and appropriate learning outcomes. It helps for clear understanding, grasping and fixing teaching materials in the minds of the students. The visual aids are those aids which call upon the visual senses and then help the leaner's to learn through viewing. These aids may be further broken into two sub-categories - Projective and Non-projective aids. Aids which help in their projection on the screen are called projective aids. When a projected aid is used, and enlarged image of the material (slide, filmstrips etc) is projected on a screen kept at a distance from the projector. The room is either totally or partially darkened.

Methodology: The present study is based entirely on both descriptive and analytical methods which were adopted through different experimental work and secondary data. The author conducted his research studies on the basis of secondary data sources, taking into account the availability of resources and the feasibility of the present Research paper. Secondary data were obtained from the different journals, academic papers, textbooks, various websites and theses, etc. The study's methodology also includes the thoughts and writings of different authors in the academic and research field's stream. Thus the author used all available resources and carried out exhaustive Studies for this research paper.

Main Body of the Paper

PROJECTED TEACHING AIDS

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Projected Materials and Projectors

A projected aid is suitable for large group as well as small groups. The projected image could be made large and bright on the screen. It includes the following materials.

1. Book diagrams, flat pictures etc.

2. Slides.

3. Film strips.

4. 16 mm. sound film.

5. Standard 8 mm. loop film cassette.

6. OHP Transparency-single/or overlay crylic sheet transparency.

7. Microscope slides/small objects.

8. 35 mm. motion picture sound film.

9. Epidiascope.

10. Slide projectors.

11. Filmstrip projector.

12. 16 mm. sound film projector

13. 8 mm. standard cassette film projector.

14. Overhead projector 15.

15. 35 mm. motion picture projector with lens.

ITS KINDS AND EDUCATIONAL ADVANTAGES

A motion picture film is a series of still pictures taken in rapid succession, developed and finally projected again as a series of still pictures, but under such conditions as to give the viewer an illusion of motion. The addition of a coordinated sound signal or track results in a sound motion picture.

Principle of motion picture films: The motion film capitalizes on the weaknesses in the human eye which is called the persistence of vision. Any object that is seen by the human eye will remain in the field of vision for a small length of time, i.e. 1/16 second, even though the object recedes. Hence, if a series of 16 still pictures are taken in rapid succession, developed and finally projected on the screen as a series of pictures; it will give the viewer a sense of motion.

Educational institutes use 16 mm. projectors. There are many different 16 mm. motion pictures projectors, made by various manufacturers. Each has its distinctive characteristics and advantages but all are similar in principle.

The 16 mm. motion film offers many opportunities for the improvement of instructions. Through basic motion picture techniques such as direct photography, changing speed photography, photomicrography and animation etc. can now be brought into any classroom.

Kinds/Classification of sound motion-picture Films

Motion picture films can be classified as entertainment films and educational films. Educational films may be further sub-divided into two parts.

1. **General Educational Films.** These are produced to provide general knowledge.
2. **Classroom Films.** These are on curricular subjects produced for promoting learning in a specific curricular subject

In another type of classification, these films can be kept in two sub- groups.

a) **Basic Teaching Films**. These are usually made specifically for use in carefully designed curriculum area. These films are planned and produced to improve teaching.
b) **Supplementary Teaching Films.** These films are invariably made for some purpose other than enriching and implementing the school curriculum. Because most films have educational values, untold number of those made for extra school purposes contain information, which is of value in improving regular school learning situation.

Supplementary teaching films originate from many sources. Theymay be grouped into three classes.

(i) Documentary films
(ii) Sponsored films
(iii) Entertainment films.

The documentary film can be an extremely useful teaching instrument, particularly in the social studies area. Good documentary film can show students how people live, think and act.

News reels are produced by the Govt. of India. Some important news of the country are made to reach the masses through such films. It may be on some current event of our own country or some other country etc. This type of films acquaints the people with the latest happenings.

Procedure/Method of showing a film in the classroom

Films provide a lot of useful information to the learners apart from their recreational value. But they should be shown properly in a systematic way. Before showing a film, the teacher himself should know well the contents of that film.

The greatest responsibility is incurred when the teacher actually prepares to use the film in the classroom. The process involves three steps

1. **The Preparation Stage.** The teacher should have the knowledge of the sources from where educational films related to his subject may be borrowed or purchased. He should make himself trained in the operation of the motion picture alliance. All the material i.e., projector and screen etc, must be checked before use.
   In this stage, teacher should get his students prepared educationally as well as psychologically for deriving the maximum educational benefit from these films.

2. **The Presenting Stage**. The Teacher should involve the students in this stage. He should make them properly motivated, attentive and active while presenting useful information through films. He must see that the students should note down important points, reactions and doubts which need for more information. The teacher should present the film step by step by calling

for the students' attention to all the important points of the film.

3. **Follow-up Stage**. Here, the teacher should see the effect of the film on the students by proper evaluation. There should be a free and fair discussion on about the contents or subject of the film. The application of the information rendered by the film should be properly explored by the teacher and students.

Selection of Films: A teacher should select and choose a specific film out of a large number of teaching films very wisely and carefully He should take into consideration the following points in this regard

a) The film should contain authoritative information. It must have authenticity.

b) It must serve the curriculum purposes of the pupils.

c) It should be of the mental level of the students.

d) It must have a good quality of photography, well organized and well audible.

e) It must be accompanied by teaching aids. These may take the form of study manuals or study suggestions concerning its effective use in one or more learning situations.

Educational Advantages of Films

1. It increases pupil's interest in learning. It is natural to learn by seeing and hearing.
2. Action gives impression of reality and promotes better understanding.
3. Motion films compel attention and as a result, help in permanent retention of observed events.
4. Many general topics can be covered and conveniently presented in an easily digestible form and in an interesting way to maintain attention.

5. It increases factual learning as compared to traditional learning.

6. Fast and slow motion can be shown to occur at normal speed, making analysis and appreciation possible.

7. These films present material that cannot be seen by the human eye or even by microscope and telescope. Technical animation involving animated drawing can effectively serve to explain things that are two abstracts, too large or too hidden.

Precautions: The film should never be accepted as a mechanical substitute for good teaching. Rather a carefully selected teaching film is a tool of instruction, which wisely used, can bring results in terms of interest, learning and pupil activity far beyond those traditional learning materials.

Educational films should be devoid of anti-social activities, and abnormal behaviour. Any film can be considered educational if it promotes learning in general in any aspect of knowledge, correct attitude and behavior.

FILM-STRIPS, ITS CHARACTERISTICS AND ITS ADVANTAGES AND PROCEDURE OF USE IN INSTRUCTIONAL PROCESS

Among the various types of materials available under 'still projection', slides and filmstrips are the foremost visual aids. A film strip is a piece of non-flammable safety film 35 mm. wide, varying in length up to about one meter. It is a related

sequence of transparent still pictures and may contain anything from 10 to 50 pictures or frames. These pictures may constitute a connected series of drawings, photographs, diagrams or a combination of these and illustrate a single topic, theme or story.

Some film strips are accompanied by commentary recorded on records or tape. Such film strip is called a 'sound filmstrip'. The recorder the tape usually carries a narration and may also include appropriate music and sound effects. Filmstrips may be produced using 35 mm black and white or colour film.

Filmstrips can be prepared either in 'single frame' or 'double frame'. In the case of the single frame, the size of each picture or frame is 18 x 24 mm and in the case of the latter, the size is 24 x 36 mm. In both the cases, the longer dimensions usually correspond with the horizontal of the picture represented.

- **Characteristics/Merits** - The film-strip

  (i) Is easy and convenient to use.
  (ii) Takes up little space and is easily stored.
  (iii) Is available in either colour or black and white.
  (iv) The pictures are in sequence.
  (v) Is inexpensive.
  (vi) Can be used at any desired pace, because the pictures can be left on the screen as long as the instructive desires.
  (vii) These are available for a wide range or grade levels and subject area. Effective use of Film Strips.

- **The Effective Use of Film Strips.** The effective use of film strips involves the following steps:

1. Selection. To secure effective results with film strips, the teacher must first select film-strips which tell their story primarily through picture, rather than words. The pictures must be of such nature and quality as to contribute something at once significant and unique to the learning situation.

2. Preview. A careful preview of the selected filmstrips is required for the purpose of preparing the instructor. He must know that what the filmstrip contains in planning and how to use it with his pupils. Also, he must know that what points require additional classification.

3. Class preparation. Teacher must explain why the pupil's are shown this film strips at this particular time. He should indicate clearly what do look far. He should also anticipate new or difficult words, phrases and symbol.

4. Presentation. Mechanical as well as instructional considerations are involved in the effective use of film strips, should fit smoothly and naturally into the learning experience.

5. Evaluation/Follow up. This step includes evaluation and application. After the film-strip has been used, for evaluation, a brief written or oral test can be given or better still, the teacher can call for a practical application. The follow-up discussion will provide the teacher with opportunities to observe reactions and new points of view and to answer questions which suggest further activities.

Advantages: Sound film strips are chiefly valuable in providing standardized instruction. Such instruction is desirable for certain technical and industrial processes.

The sound film strip has accordingly been extensively used industrial and military training programmes, where uniformity is of primary importance. Film-strips are of great value in visual teaching situations, especially when

motion is of little or no importance for understanding.

Preparation of Simple Slides

A teacher can himself prepare slides for his use. Preparing a simple slide is not a difficult job. For it, he should adopt the following method.

1. Material like a plain glass, etched glass or translucent paper etc is selected as the base material for preparing slides.

2. A rough lay out is laid down. Then the basic illustration is sketched and other symbols or lettering is positioned according to plan.

3. Now, the glass or cellulose acetate on which slide is to be prepared is placed over the original sketch or lay out. By using a drawing pen or marked pencil, the figure is traced out.

4. For better illustration, colours may be added or some art work may be done.

5. Then, the transparent sheet is attached to the back of a cardboard mount with the help of pressure sensitive tape.

Photographic Slides: The slides can be produced with the help of suitable camera by taking photographs of the object or events In these days, the science of photography has been developed to such an extent that it is possible to expose, develop, fix and mount a slide ready for projection in a few minutes. These are called photographic slides. After the photographic film is developed and printed on to a transparent glass plate. After its development the positive print is covered with glass which protects the image surface of the plate. Then the two pieces of glass are taped together along the glossy edges and the slide is ready for projection.

Sources of Slides: Commercial slides are available for a great variety of subjects such as art, bird study, foreign and domestic geography, history, literature, health, home, economics, meteorology, zoology etc. In our country, the slides on topics related with varying subjects may be borrowed from the National Museum, National Libraries, NCERT etc. A teacher can also prepare these slides himself as described above.

Effective Use: Good results with any projected visual material require good project in equipment. To be effective, a slide must be seen easily by every member of the class. This requires a projector with an efficient lens system and a lamp sufficiently powerful for the conditions under which it is to be used with the proper equipment.

Advantage/Educational Values: The slides serve many useful purposes in the classroom situations. Sometimes, a slide is prepared for some difficult diagram or picture appearing in the book.

The slides possess tremendous educational values. According to Haasand Packer, slides have the following educative values and advantages.

1. Attractive attention.

2. Arouse interest.

3. Assist lesson development.

4. Test student's understanding.

5. Review instruction.

6. Present next lesson or subject.

7. Facilitate student-teacher participation.

Apart from this, the other advantages are

8. Details of the subjects or the diagram can be shown very nicely with the help of slides of layer size.

9. Their handling and storing is not difficult.

10. They can be procured easily and at low cost.

The smaller slides can be projected in the same machine that is used for film strip. Reproduction of large maps, complicated charts and diagrams, tables and other material, in which printing and fine detail are important, can be presented more effectively on the larger slides.

Drawbacks: Although slides and filmstrips are essentially similar, the latter replaces the former in its utility for a variety of reasons. For example, a pack containing a number of glass slides on a particular topics usually bulky. Further each slide must be put in the slide carrier correctly so as to get an erect image without lateral inversion on the screen. The slides should also be put in correct sequence during projection. These difficulties are avoided in the case of filmstrips.

Overhead Projector and Its Advantages in the Field of Education

It is very useful and commonly used teaching aid in the field of education today. The name comes from the fact that the projected image is behind and over the head of the speaker. In overhead projection, a transparent visual is placed on a horizontal stage on top of light source. The light passes through this transparency and then is reflected at an angle on to the screen at the back of the speaker.

Using OHP is not a new concept. It dates back to World War II when the armed services employed this equipment for teaching recruits.

The Design of OHP

Overhead projectors are designed for direct or indirect projection. The projectors designed for direct projection usually uses Halogen lamps. While OHP designed on principle of indirect projection use the tubular projection lamps as in a film projector.

OHP contains an area of vertical projection besides the straight horizontal path of the light available with the usual projectors. The path of the light is again charged to a horizontal one by a mirror placed at 45° angle and continues over the shoulder of the instructor to the screen.

In contains a large aperture of the size 25 x 25 cms or 20 x 20 cms for placing the slides and other visual materials.

In all the overhead projectors, the lamp enclosure is blower cooled. The project in lens is a combination of two lenses with their principal axis at right angles. There is a provision for the focusing of the image on the screen by vertical movements of the projection head.

Use of OHP: The general precaution to be observed for use ofany projector should be observed when using the OHP.

The projector should not be subjected to mechanical vibrations. Provision for voltage fluctuation should be taken care of using a voltage stabilizer or by having a suitable choke in series.

The lamp should not be touched by hand. OHP should not he kept on continuously for long periods.

The Fresnel lens is protected by a glass plate on top. It is necessary to remove dust or dirt on the protecting glass and also from the outside lenses surface by flat camel hair brush. Surface silvered or aluminised reflector should not be cleaned. Tri-acetate sheets are available in large rolls of 75 cms width which could be cut into sheets of dimensions 20 x 25 or 25 x 25 cms. They can be suitably mounted on suitable cardboard mounts.

Advantages of OHP

1. A very large projected image in a minimum of projection distance is obtainable.

2. It can work in an illuminated room. There is need of darkening the room.

3. The teacher can always face the class, maintaining eye contact with the pupils.

4. Whether in a teaching or a presentation situation, the audience sees the visualization from the same point of view as the communicator. The feeling of oneness with the communicators created.

5. The comparative lighter weight of the equipment makes it portable.

6. The teacher can maintain complete class control and interest in a lesson by turning a switch on or off.

7. There is no need of a projector operator accompanying the teacher. He can face the class and at the same time operate the machine himself.

8. The working of the projector is quite easy. Anybody can operate it at any time.

9. Large slides of the size 25 x 25 cms can be used easily. It may facilitate the preparation of art work for slides.

10. Effective visuals can be made in a minimum of time and at low cost. Once a transparency is made, it is permanent. It need not be erased as in a chalkboard.

Instead of presenting static pictures on the screen, the teacher with the help of OHP can develop the diagrams. The teacher, by moving an opaque or coloured pointer on the stage, can very easily focus the attention of the class on the screen, on the required aspect. The teacher can cover the completed visual on the stage and by sliding an opaque cardboard can progressively disclose one item at a time in stage.

NON-PROJECTED TEACHING AIDS

The visual aids are those aids which call upon the visual senses and then help the learners to learn through viewing. These teaching aids may be further divided into two sub-categories – Projective and Non-projective aids.

Non-projected aids are those which do not help in their projection on the screen. There is a long list of projected aids being used in teaching learning process. It includes the following teaching aids.

1. Visual (Pictorial) Non-Projected Two-dimensional.

(i) Black board writing and drawing

(ii) Charts

(iii) Posters

(iv) Maps

(v) Diagrams

(vi) Graphs

(vii) Photographs

(viii) Cartoons etc.

2. Visual Non-Projected Three Dimensional.

i. Model
ii. Mock-up
iii. Diorama
iv. Globe
v. Relief map
vi. Specimen
vii. Puppet
viii. Hologram etc.

Graphic teaching aids and their importance and uses in teaching-learning process.

Graphic aid material represents a particular type of visual aid material that involves the use of graphic presentation in the form of graphs, maps, charts, diagrams, posters and cartoons etc. These

are the form of visuals that are represented on plane surface. The subject matter areas that are represented in graphic aids are in an abridged and easily understandable form. They convey meaning mainly through relatively conventionalized symbols that are nearer to reality perceptually than verbal symbols.

Graphic aids secure the attention of the pupils by their attractive format and simplicity of layout. They convey the expected message by combination of visual and pictorial messages made meaningful by suitable captions.

Advantages: Graphics are only two dimensional. They are able to secure the attention and create interest of the pupils. Since the message to be conveyed pertains to a single concept and hence, brief the viewer will not get perplexed on being exposed to the visual but will try to read and understand what is implied.

Graphic aids could easily be prepared by any teacher using simple materials that are easily available and stored for future use. Making graphics should form an integral part of the teacher's preparation for teaching.

Important Graphic aids: Almost any material involving illustrations is basically graphic in nature. There can be an infinite variety of graphic material. It is difficult to give a rigid list of these materials. However, through common usage, the principal categories of graphic aids are described here.

1. Diagrams. A diagram is a drawing that shows arrangements and relations as of parts to the whole. It is a visual symbol made up of lines, curves and geometrical forms. Diagrams could be used to explain many facts easily using a variety of symbols and labels. These can explain facts more easily than charts. Technical fields like engineering rely heavily on diagrams to communicate detailed, precise information. But basically, a diagram explains rather represents a fact. It contains both pictorial and verbal part.

2. Graphs. A graph is a diagrammatic treatment or representation of numeric or quantitative data. The different types of graphical representations are Line, bar, pictorial and sector (pie) graphs. Line graph consists of portraying data with the help of lengths and shapes of lines. Bar graphs consist of bars arranged horizontally or vertically from A zero' base. The pie graph consists of the sectors of a circle shown by different colours or types of shading. In pictorial graph, the visual presentation is made through pictures.

The nature of variation of two dependent quantities could be very easily presented by graphical representations. Interpretation of graphs is easy and very quick. Correct inferences could be drawn with ease.

3. Maps. A map is a visual representation of the whole or part of the earth. It gives an accurate representation on a plane surface in the form of a diagram drawn on scale, the detail of boundaries of countries, continents etc. Geographical details like location of mountains, rivers, altitude of a place, contours of the earth surface and important locations can also be represented accurately with reference to a convenient scale with a suitable colour scheme.

So, map is drawn to a scale and maintains the directional relationship of the parts. As a teaching aid, maps are indispensable in teaching fundamental concepts such as size, distance, space, location and direction.

4. Posters. A poster is a bold and symbolic representation of a single idea. It aims for conveying the specific message teaching a particular thing, giving a general idea etc. A poster catches the eye and makes the viewer go through the message conveyed. The visual designis dramatic and hence dynamic in appeal.

Posters are used widely in all walks of life, to convey, forcibly the desired information to a layman. Good posters are simple as well as striking.

5. Cartoons. A cartoon is a metaphorical presentation in the form of a picture or a sketch. It vigorously presents and dramatises humour, satire, caricature or exaggeration about an idea, a person or a situation. A cartoon like the poster is universal in appeal and conveys only one idea. Many times, cartoons acquaint their viewer with the hard realities and naked truths and thus may work as a source of behavior modification. They appeal to all ages equally in almost all the cultures of the world.

6. Illustrations (Flat pictures). Illustrations may be hand-drawn photo-graphic reproductions, lithographic reproductions which are self Explanatory. They are complete by themselves and do not require any lengthy explanation. Flat pictures are used generally as illustrations. These are a still opaque representation of a scene or object.

Good picture illustration should have good picture quality, good composition good contrast and sharpness, effective colour and should communicate the idea clearly. Such pictures costless are readily available and can easily be made and used but often they are of a small size, lack depth and motion.

7. Flash cards. Flash cards are pieces of cardboard or hard paper on which a word or words are written or some picture is drawn. These can be shown to the students at any time.

Flash cards can be successfully used for a number of purposes –

(i) Word recognition.

(ii) Team competition-By dividing the class into two parts, the flash cards are shown to the group one by one. They try to read out as quickly as possible.

(iii) Teaching writing-practice for good hand writing.

(iv) Training in speaking-students read out the flash cards.

These are handy and can be used very easily by the teacher.

8. Charts. A chart is a visual symbol for summarizing or comparing or contrasting or performing other helpful services in explaining subject matter. In its content and form, a chart overlaps heavily with a diagram. Hence a chart is also considered a diagrammatic representation.

Charts can present virtually anything except statistical or geographical data.

Types of charts- charts are of different types.

(i) A time chart represents material in their chronological sequence of happening with suitable indication of time of Occurrence.

(ii) Tabular chart presents information and date in a classified or categorized form arranged in tabular columns.

(iii) A tree chart depicts growth and change by beginning with a single source which then spreads out into many branches as in the case of a tree.

(iv) Stream chart depicts development, growth and change by beginning with many tributaries which then converge into a single channel.

(v) Organisational chart represents the functional relations within an organisation.

(vi) A process chart represents the stages of steps in a process.

(vii) Sequence charts consist of more than one segment or chart and hence have to do with the representation than content.

(viii) The other types of charts may be- Flow charts, Issues charts, Pictorial charts, Technical diagrams etc.

Purposes of charts- The following are the specific objectives of using charts.

1. To show relationship by means of facts, figures and statistics.

2. To present material or content symbolically.

3. To summarise information.

4. To show continuity in process.

5. To present abstract ideas in visual form.

6. To motivate the students.

7. To create problems and to stimulate thinking.

In the classroom, while teaching these charts may prove a big helping hand for the teachers. They save their time and energy which can be wasted otherwise in drawing figures and diagrams on the blackboard for classifying various facts and concepts. Readymade charts are available for use in teaching in almost all areas in all subjects. But it is not difficult for any teacher to prepare a chart. In fact, a teacher would find a chart prepared by him incorporating has own ideas and lines of approach of the specific topic more useful to him.

But, while preparing a chart the following points shall be kept in mind-

(i) Concept or theme to be developed in the chart.

(ii) Analysis of the main theme in various relationships which are to be developed.

(iii) Visualization and illustration of ideas by sketches.

(iv) Colouring and lettering.

Projection tracing is an easy way to make a large chart or diagram from a small illustration. A small picture can be enlarged by using opaque projector.

Charts should be carefully stored and preserved for use in future. The same chart could be used over a number of years if carefully preserved. The charts may be backed up by passing gauze cloth on the back with adhesive paste.

There should be a provision for hanging the chart in the classroom. Teacher should also have a pointer to point out specific factors in the chart. Charts should be large enough for details to be perceived by all the pupils in the class.

It is desirable for a teacher chart to contain minimum written matter. A chart should not appear to be a page from a book. Lastly, the chart should not be used for a large group. For large groups, a projected aid would be more suitable.

Use of Graphic Teaching Aids: Graphic teaching aids are quite effective visual aids that appeal to all, arouse interest, attract and hold attention and activate the teaching learning process. Ideas and relationships can be classified with their help. These save time and energy of teachers.

But, for its effective use- the teacher must try to select an appropriate graphic aid for realizing his teaching objectives.

- The aid must have the qualities like unity, simplicity, organization and visibility.
- The aid must have educational value. It should not be presented simply for admiration or entertainment.

- If necessary, these aids should be supplemented with other visual or activity aids.

Graphic aids could easily be prepared by any teacher using simple material that is easily available and stored for future use. Making graphics should form an integral part of the teacher's preparation for teaching.

3-D (Three Dimensional) teaching aids and 3-D aids and their educational advantages.

These teaching aids have three dimensions - length. Breadth and height. Real object is the best source of learning. But for various reasons, it is not always possible to bring the real objects in the classroom. The real object may be too complicated, small or big in size to be brought in the class. It may move too slowly or rapidly to be studied completely. It also may be too dangerous and expensive for ordinary class use. In such situations, a teacher has to search for some good substitute for the real objects, which are three dimensional in nature. Those represent the reality in the class to a great extent.

Here, some important 3-D teaching aids will be discussed.

1. Models. A model is usually the miniature structure of the original subject. It shows almost all the details of the original thing. It may be of the same size or larger or smaller than the original object that it represents. Model is three-dimensional teaching aid. It can be seen from different angles and so it is generally more interesting and instructive.

Purposes of Models in Instruction -

(i) Models simplify reality. As they are three dimensional, they evoke greater interest.

(ii) Models concretize abstract concepts.

(iii) A large process could be easily demonstrated by a model as they provide interior views of objects and machines.

(iv) Models are compact dimensions so that they can be used in the classroom for teaching.

(v) It may not be possible or practicable to make pupils see the whole of a large industrial unit, but a small-scale model will give the correct concept.

(vi) Preparation of models could form a topic for project work. A working model will secure immediate attention and will serve as motivational. Interest stimulated could be utilised for fullest advantage.

Types of Models: The models are of the following types -

1. Scale Models: These represent the things through exactness of scale.

2. Simplified Models: This type of models shows roughly the external form of objects.

For examples, models of animals, birds etc. are all simplified models.

3. Cross-sectional Models or cut away Models: These models show the interior side of the object along with the exterior side. For example, model of an aeroplane etc. These are also called working models.

Uses: Models are used for demonstrating the three-dimensional representation of real things like models of an eye or abstract things like model of solar system. They can be used in a wide range of instructional situations.

They are particularly used for three special purposes-

(i) As visual support material in instruction.
(ii) As object for study or manipulation in individual learning; and
(iii) As construction project for individuals, small groups or even the entire class.

Preparation: A teacher or student can prepare models in different ways. The standard technique is as follow

(i) Use the cheap material to prepare static models like models of dam or building etc.
(ii) Use the materials like modeling clay and plastic lime to produce realistic models of living creatures, organs of a human body etc.
(iii) Use the materials like plaster of Paris and paper mache to produce a physical map of continent, or a country or landscape of a particular area.
(iv) Thermocole models are used for domestic purposes and could be used to prepare static, to a certain extent working models. Only poster colours, distemper could be used to paint thermocoles.

Any pupil constructing a model will definitely learn more than what he will learn if exposed to a similar model by the teacher because of the direct experience involved. Models which can be dissembled and assembled by pupils have enormous learning value. Models should be used only if it is not possible to get real objects to the classroom or when the real objects would not be helpful to give a better explanation.

2. Mock-ups. Mock-ups is a special form of model. It may not be similar to the original in appearance. It is an imitation of a thing in certain respects only. Here some element of original reality is highlighted to make it more meaningful to the students.

A mock-up may be defined as an operating model, usually at full scale, designed to be worked with directly by the learner for specific training or analysis.'

When the direct first-hand experience is either impractical or impossible, mock-ups can be used. Mock-up is an imitation of a real thing. Some elements of the real thing may be purposefully eliminated in order to focus attention on others.

Mock-ups are very useful in giving training in complex skills.

3. Maps and Globes. A map is a flat representation of some or the earth's entire surface. Globe is a spherical model of earth. It is a scale model of the earth in three dimensions. Relief maps are also three dimensional. Globes are the only kind of maps that can give pupils a true concept of geographical relationship. A good globe provides correct information about areas, distance, directions and geographical shapes. Maps and Globes are not merely fundamental to the study of Geography and other subjects but are essential for a whole range of human activities such as interpreting weather, travel, understanding current world events etc.

4. Diorama. A diorama is a still display system which combines a three dimensional foreground pictures, figures etc., with a two dimensional painted background, thus creating a highly realistic effect. It is very useful media in the teaching of many subjects like history, geography and biography etc.

How to produce 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 cardboard/ hardboard.

2. Make up a strip of thin white card of a suitable height that is capable of extending all the way round the curved side of the base, draw and paint the required background scene in this and fix it to the base.

3. Build up any landscape required in the foreground using Plaster of Paris and paint this in the required colours.

4. Produce or acquire any material required for the foreground and set them in position. Such material can include model figures, model buildings, model trees, model ships, tanks or other vehicles; pieces of rock and any other required material.

The objects in a diorama are not made to scale for representation of depth. Objects kept at a background are made considerably smaller to create an illusion.

5. Puppets. Puppets are available in the market or can be prepared locally according to the requirements. It is a very useful media in the teaching of history, drama and literary topics. Puppets can be made of cardboard, cotton, colour and other locally available materials.

Puppets are used to dramatise any historical event like war, life of people during a particular period etc.

6. Holograms. Holograms are three dimensional images of wonderful reality. These images are created on a holographic (lens less photography) plate without a camera. Holograms are less frequently used in schools, as preparing them requires lot of technical skills as well as equipment. They are very costly also.

Proper use and selection of 3-D teaching aids 3-D teaching aids are powerful interest arousing devices that possess the capacity of bringing into play all the five senses of human beings.

For good use proper selection of 3-D is essential. It should be a true representative of the real object. It should be selected according to the mental level and needs of the pupils. Necessary demonstration for the use of these aids should be taken by the teacher. Finally, the students should be made to participate actively in handling these objects for realisation of the set objectives.

Display boards, its functions and useful in teaching-learning process with its different types

In well designed modern school buildings, there are extensive display board spaces in classroom, display cases located at vantage points, 'teaching walls', made up of folded sliding panels which can be extended to form a partition between one classroom and another and at the same time provide a lot of display, space etc. All these, rather than the more Bulletin Boards come under the general head of 'Display Boards'. Varied and colorful displays which both communicate information and incite interest and involvement, impart to school and its classroom a vitality needed for motivated and purposeful learning.

Functions of Displays: Display (Board's) are used for the following.

(i) Motivation. In the course of a unit of work, a good display can attract and appeal to the learner, stimulate the curiosity and imagination of most of the people.

(ii) Development. As the discussion proceeds, a display may add information for fixing up of ideas in the minds of the students. A development display actively involves the students both in planning and execution of the materials.

(iii) Summary. At the end of the lesson, a display may be used for review and consolidation.

A study display is an organised visual arrangement of learning materials on a vertical or horizontal surface and is usually designed to present significant information on a given topic.

Types of Display Boards- These are of many types;

1. Bulletin Board. It is a board of soft wood or Cork. It is used for pasting papers, pictures of paintings. It displays announcements, records, news items, newspaper cuttings, illustration etc. The board is generally located at some important place in corridors or in the classrooms. This type of board helps in popularising any idea. It is useful not only for teaching-learning processes but it also brightens the outlook of the school.

2. Flannel Board. As name indicates, it is a wooden board on which flannel is fixed. The different flash cards on the back of which flannel are fixed can be placed on the flannel board. Flannel Board is helpful in displaying the other aids. A few other aids can be adapted to be used with the flannel board. It can be used for teaching of spellings, reading in English, formation of sentences, picture composition etc.

3. Pocket Board. It is a wooden board on which pockets are made with about 1/2-inch-wide cloth wrapped from one corner to the other parallel to the base of the board. The pockets are formed for holding the flash cards.

4. Peg Boards. Peg boards can be used for combining flat and three-dimensional materials, the latter being supported by specially made hooks and clips. Displays can also be positioned as desired points by pegs."

The specially made hooks can support fairly heavy objects. Peg boards must be mounted 1/2" out from the mounting surface.

5. Hook and Loop Boards. These are intended to suspend heavy 3-D objects as well as flat materials. The surface of the board is made up of a special nylon fabric that consists of thousands of tiny but strong loops. An adhesive backed patch on which comparable numbers of tiny hooks are woven is affixed to the object to be displayed and the object is then pressed on to the board surface. These boards are not at present manufactured in India.

6. Magnetic Boards. These are useful to show the relative movement between elements of visuals. A magnetic chalk board becomes more versatile due to the additional facility of visuals that could be made using chalk. A sheet of iron that attracts a piece of magnet can be used for magnetic board. Small, ceramic magnets can be fixed to the back of the display cut out by fevicol.

Planning and Organising Displays- It should be done as follows:

(i) Decide on a purpose-motivational, developmental or summary.

(ii) Choose and illustrate the headline-Large, easy to read, brief and horizontal.

(iii) Arrange and illustrate the contents-use illustrative materials that are eye catching such as photographs, drawing, maps, graphs, 3-D objects etc.
Compose the material artistically and highlight the main theme by a catchy device.

(iv) Use colours of various types-use warm and cool colour for contrast. Warm colours such as red appear closer to the observer than do cool colours such as blue.

(v) Arrange the display-Mount the picture and articles in pleasing coloured background in harmony with the rest.

Simplicity and brevity are keys to good arrangement.

Limitations:

1. Good displays take considerable time and energy of the teacher.

2. Like any other medium, display may be overdone and hence may lose their freshness and appeal.

3. Sometimes displays may become cluttered and lose their effectiveness.

4. It may distract the attention of the students while learning in the class.

The study displays on display boards can provide a lot of the help for the retarded learners who are generally visual minded. Those provide practice for all students in ordering and sequencing of ideas.

Audio aids and their value in teaching-learning process:

The aids which use sense of hearing are called audio aids. These aids include –

Human voice, Gramophone records, Audio tapes/discs, Strereo records, Radio Broadcast and Telephonic conversation.

Out of this Radio and tape-recording are very important teaching aids.

1. Radio. Radio is a very common type of audio teaching aid. It is an unparallel vehicle for mass communication. It is now recognized as an education medium that reaches millions of interested listeners. The use of Radio for educational purposes was tested in England in 1924. Later on Canada and Sweden tried it in 1926. In India, the first radio station was established in Mumbai in July 1927. School broadcasting was started in 1937 from Kolkata. Since then the school broadcast has increased. At present, most, AIR stations broadcast educational programmes for schools and colleges.

Importance & Merits: Highlighting the importance of the Radio, George Watson says, "Radio is not an addition to education. Radio is something to be placed on top of education. Rather, radio is education." As a supplement to classroom teaching its possibilities are almost unlimited. Its teaching possibilities are not confined to the five or six hours of the school day. It is available from early morning till long after midnight.

The Radio medium is very exclusive for broadcast of lectures by eminent educationists, scientists, historical statements, etc. It is a rich, medium of drama, stories, commentary, sports news, educational news and educational programmes.

Radio programmes are 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 is specially produced audio cassettes is also useful in classroom instruction.

Institutions such as central institute of educational technology, NewDelhi, State Institute of Educational Technology, Educational Technology, Cells of SCERT produce need based auto-preprogrammes for schoolchildren.

Radio brings subject experts and other great men in the classroom. Lectures, talks and addresses of important personalities from any comer of the world can be heard. On the Radio broadcast, It can be heard and understood by a large number of students at a time. The cost percapita of the listeners is very small. It also widened the general knowledge of the students.

But the Radio broadcast is one way communication. The time of the broadcast does not always suit the school or class. There is no

provision of correction work given by the radio for home assignments.

2. Audio Tape or Tape Recording. A tap-recorder is used to record sounds on magnetic tape which can be reproduced at will as many times as required. When a new recording is made, the recording already contained in the tape is automatically erased.

Importance and Educational value

i. Audio tape is a more popular teaching tool. The teacher can make live recording of student and teacher conversation/dialogues etc' as it is much easier to prepare these tapes than a gramophone record. This is very useful in independent study situations.
ii. Tape recorder can be used to record music and other sound effects for use during staging of dramas in schools and cultural performances.
iii. Tape recorders are very largely used in language laboratories for giving speech training and for correction of pronunciation defects.
iv. Tape recorder can be used for appreciation of and for teaching music.
v. Commentary to filmstrips can be suitably recorded on a tape recorder and the tape may be played back while the students view the filmstrip picture projected on the screen.
vi. In teacher training institutions, a tape recorder can be used effectively during the micro teaching sessions. It will provide the necessary feedback for improvement. 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.

3. Record player. Record players like tape recorder are a means of audio playback. Of the two, record players are older types of hardware using records or discs for the needed playback. The use of recorded pieces in education has much value in language learning, appreciation of poetry, literature and presentation of brief dramatised episodes from history, not to mention development of musical knowledge and discrimination. At present the older manually wound spring powered gramophone has become practical obsolete. Its place has been taken by DVC and other advanced electronics machines.

Advantages of Audio Aids:

1. Radio sets, tape recorders etc are not expensive in comparison to other electronic media.

2. These can be used with the help of battery sets. No electricity is required.

3. These are comparatively handy and quite portable.

4. Production of educational audio programmes is easy and does not require many technicalities.

5. Production cost of educational audio programmes is quite reasonable.

6. These recorders can play back tapes according to convenience of the learners.

Disadvantages:

1. Audio-programmes are only sound based and have no visuals. Hence, these programmes can be boring.

2. Radio is one way communication aid. It misses the personal touch.

3. Audio cassettes tapes are generally developed locally. So professional quality is often sacrificed.

For good results, in these aids sound being the only or the main medium, has to be supported by printed materials, posters, slides, pictures etc.

There should be imaginative use of humour, elasticity suspension, curiosity etc in educational audio programmes. In order to make audio programmes effective, teachers should conduct audio discussion before, during and after the programmes and organise other follow up activities.

CONCLUSION

Media is a means that can help teachers transfer their knowledge to their students. There are many kinds of media which can choose to use. But, when using media it must be depended on some criteria, such as audiences (learners), materials, school equipments, time allocated. Therefore, we as teachers have to know exactly what our students needs. So, we can make them better and being success.

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