

**EDUCATIONAL
TECHNOLOGY
HANDBOOK**

2000

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MPHIL ADMINISTRATION (HIGHER INSTITUTION)

UNIVERSITY OF EDUCATION

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PREFACE

The Education Technology Hand Book for Professional Teachers is designed to provide complete and easily accessed information related to the area of Educational Technology. Educational Technology materials are presented in a straight forward, topical organization that complements instructional procedures and suitable for quick, and easy reference.

Many of the topics contain clear step-by-step procedures for specific operations. They also contain relevant background information on tools and materials that would be used to the advantage of both the teacher and learners.

In addition to providing motivating illustrations and examples for making teaching effective, it also encourages students' activities.

The author is extremely appreciative of the assistance received during the development of this text.

J. Asomani

(M.Phil Wood Tech)

DEDICATION

This work is dedicated to

2 Kizito Lwanga Dzakpasu

And to all sandwich certificate students (1999 / 2000 year group)

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I owe a debt of gratitude to Mr. Samuel Adu-Gyamfi who read through the draft and made some very useful suggestions. To my colleagues Messers Nsoh Stanislaus, Banuenumah Walter and Asomani, Joseph for their moral and spiritual support. To the management and staff of **W.E.T.C.** printing press for exercising such restraints and sacrificial time during the course of printing. And to all those who helped in one way or the other but who have not been singled out for special thanks.

GOD bless you all.

ZAPS

Forward

Educational Technology is a course that should be taught in every teacher training college in the country. Apart from the teacher training colleges, these should be introduced as refresher courses or in-service training programmes for teachers on the job. This is because an introduction to Educational Technology can improve on the impact of teaching, and consequently on academic performance. Also it reduces the waste that goes into teaching and makes teaching standardized and challenging. Educational Technology is basically the effective and efficient use of audiovisual materials in our classrooms.

In Ghana, although the use of audio visual materials have created the potential for change in most service sectors of the economy, its rate of adoption in education, unlike in business, has been rather slow. In almost all our schools, teaching - learning remains fundamentally the same as it was almost a century ago. The conditions in the normal classrooms are unbearable. For example, one teacher faces some sixty or more students for two hours or so and the textbooks students and teachers use are still the dominant basic technology.

Teachers think teaching and learning materials are only necessary when it comes to promotions and inspections so these are shelved until some one is due to be assessed. Teachers say it is the responsibility of the head to make teaching and learning materials available and so long as this is not the case, they are not obliged to use instructional materials in their teaching.

In today's educational institutions, students use electronic gadgets a lot whereas teachers still rely solely on the traditional mode (use of chalkboard) to deliver lessons. In addition, textbooks are woefully inadequate and cannot meet the demand of the large number of students in our schools. These textbooks are also very expensive. As a result, most of our students rely mostly on archaic textbooks, or pamphlets that are not officially approved or textbooks which are mostly rejected in the advanced countries.

Studies have it that, all over the country, the standard of education is deteriorating. It is important to know that today's students are tomorrow's workforce, as a result, parents and business leaders have expressed grave concern about the level of performance and the products that are coming into the market. Concerns expressed well known educationists indicates that some students cannot express themselves well enough and they wonder how they could have gotten out of the university with such levels of performance. Obviously, a reason is that teachers are involved in a lot of wordy explanations in the classroom are unable to facilitate understanding of abstract concepts.

The failure to examine the possible effects of school condition on students learning encourages people to conclude incorrectly that students fail either because they cannot learn or because teachers cannot teach. The conditions under which learning takes place, however, may hinder students learning and thwart teachers' efforts, and this may cause poor performances in them. If schools are designed to satisfy the personnel needs of the country then, of course, the existing situation is not the best especially when the schools in Ghana are competing with others in the developed countries and nations world wide.

As a result, we now take a broader view of the curriculum than just regarding it as being concerned with the subject matter content of education. We now tend to regard it as being the sum of the learning experiences received by the student in the school or college. In other words curriculum is concerned not only with the form of mastery of content (knowledge and skills) but also with problem solving activities.

There is a need to make education more effective. At its lowest level we need to reduce the considerable wastage, which occurs in education. We have to ensure that learning is more thorough (i.e. principles are really understood), that skills are mastered that the learning experiences offered are appropriate for the students' needs. There is a great need to educate and train more students in order to maintain economic development. This is particularly true in the area of technical education. If we are going to do this we need to make more effective use of existing resources as well as developing new resources

Our basic and most valuable resource is the teacher. Educational technology can help make better use of the teacher's time (e.g. reprographic facilities to put support materials into a permanent form). Through resource-based learning and various forms of open learning, educational technology can assist the teacher in reaching a wider audience.

There is a need to evaluate all aspects of learning more effectively. Interactive forms of educational technology can assist in this. There is a need to make education and training enjoyable. While this may not be a primary aim it is still highly desirable; there is plenty of evidence from psychology that students learn better when they enjoy their studies. This does not, of course, mean that we should not emphasize the importance of hard work and that we should not prepare students to face difficulties. One important way of making learning enjoyable is to provide a variety of learning experiences, and educational technology can be extremely valuable here. Where is educational technology particularly effective?

A simple answer to this question is that it is effective in all aspects of the curriculum. However educational technology, in the form of "special" hardware and software, has been found to be particularly effective in the following areas.

1. Because many forms of educational technology can be associated with individualized learning, it has been found particularly useful for consolidation purposes.
2. Educational technology can also be used effectively for remedial work. It can help the teacher in coping with students from a variety of backgrounds. Various forms of resource-based learning are useful here.
3. Various forms of educational technology (from duplicated handouts to digitize networking) enable the teacher to reach a wider audience and thus assist in the

wider provision of education and training (for example, in dealing with large numbers or students)

4. Educational technology (perhaps in the form of resource-based learning or resource centres) can help in making more effective use of existing resource (i.e. visual aids, handouts etc., once prepared, should be available more readily). The need for active learning can frequently be met by careful use of various forms of educational technology. (Games, simulations and role-play are particularly useful here.)
5. Some forms of educational technology such as slides, films, video-recordings can extend the student's experience by "bringing into the classroom" in vivid form, features such as other countries, special equipments, commercial applications, etc.

A major advantage of educational technology is that it can serve to promote "active learning" of various types. Games, simulations and role-play are obvious examples here, but the use of video recording and the Internet in teacher training could also be included. Working with or on some form of educational technology (however simple) can assist in the development of personal and interpersonal as well as technical skills.

Educational technology can serve as a support for resource-based learning. This enables students to work at their own pace (with reason) and to take more responsibility for their own learning. In turn this can free the teacher for more one to one contact or for working with small sub-groups.

Open learning involves a general expansion of educational provision (geographically, socially, academically etc.) and could not occur without considerable use of educational technology.

If we regard content and learning processes as essential and inseparable parts of the teaching process then we shall need to “build in” educational technology from the start. We must always remember that, while more variety is essential, any educational technology should generally be used only because it can satisfy a need, which cannot readily be met by other means. Thus one of the tasks of teaching is to be familiar with all aspects of educational technology so that they can approach their task systematically and incorporate the most effective learning experiences for their students.

It should be noted that a more “technological” approach to the curriculum need not result in a less “humanistic” approach. Teacher trainers, curriculum developers and classroom teachers must ensure that this does not happen. With careful planning and organization it should be possible to use educational technology to free the teacher for more personal contact with students and generally to make the students feel more involved in their own learning.

Technology is advancing every day. It is common to hear arguments that Educational Technology will be the key to educational quality now that we have entered well into the new millennium. So, if as teachers we emphasize on Educational Technology, we are justified. It therefore becomes imperative that, the trend should change. People involved in the day-to-day administration of schools should adapt to the change, and teachers who handle students should have the impetus to use Educational Technology in their daily teaching.

CHAPTER ONE

EDUCATIONAL TECHNOLOGY

It is very tempting to propose a cast iron definition of Educational Technology. To use a definition is to risk implying that the field is static, whereas it is dynamic and constantly changing. In one real sense there has always been a technology of education for the following reasons; teachers use their voice to excite as well as explain; chalkboard and textbooks have become such common place items in the classroom that few think of them as a form of media; lesson planning is a form of systematic development; etc.

Education is initiating the individual into worthwhile activities. Richard Peters (1959) who gave this definition of education also suggests that education relate to some sort of process in which desirable state of mind develops. This implies that any form of development, which is not desirable, cannot be considered education. And in the attempt of adopting strategies to implant what is worthwhile in the individual, educational technology can be grouped under three implications. One as essentially a “hard-ware” approach, stressing the importance of aids for teaching. Its origin lies in the application of the physical sciences and engineering to the problems of education.

Technology is seen as a means of mechanizing or automating processes of teaching with devices that transmit, amplify, distribute, record and reproduce stimuli materials and as such increase the teacher impact as well as widen the potential audience. In other words, teachers can use this technology to deal more efficiently with larger groups of students, increase power of their teaching and reach beyond the boundaries of the school or classroom – all without necessarily increasing the cost of students being taught, and sometimes even reducing it

The second implication deals essentially in “soft-ware approach stressing the importance of aids to learning. Its origin lies in the application of behavioral sciences to

the problems of education. Machines and mechanization are viewed merely as instruments of presentation or transmission.

The characteristics of this approach largely revolve around identifying appropriate aims, goals and objectives; choosing contrasting learning methodologies activities and experiences so as to make for a worthwhile and rewarding course of study.

The third implication combines the two-“hard-ware” and “soft-ware” approaches of the other two technologies. It rejects systematic development (i.e. step-by-step rigidly mechanical or mechanistic procedures) as the processes as well as on the products of teaching and learning. This approach assumes that the environment within which teaching and learning take place is as important as the actual process. This can be clearly understood in the experiment by PAVLOV in which a dog’s behavior changed just by ringing a bell. I would not want to go into the psychological aspects of it since that will be taken care of by the psychology lecturer.

In conclusion, while the first implication is largely concerned with transmission-reception problems and the second with purposeful shaping of human behavior, the third approach is warmly human in its total and integrated approach. Its emphasis is on a range of contrasting skills from which selections can be made depending upon the nature of problems posed. It is fundamentally a problem-solving approach, heavy in its diagnostic, interest and enquiry orientation.

Generally, people confuse Educational Technology with electrical or electronic gadgetry. They may have a link but are very different in principle. Educational Technology is concerned with the design and evaluation of curricula and learning experiences, and with the problem of implementing and renovating them

An attempt has been made in this book to provide student teachers with the basic information regarding the availability; production use of audio, visual and audio-visuals in the educational field. The emphasis will be placed on relating Educational Technology to the individual’s teaching situation and to make students teachers aware of the

potentials of hardware in aiding and improvising the learning process. Other lecturers will handle the other implication “soft-ware”.

IMPORTANCE OF EDUCATION TECHNOLOGY TO THE TEACHER

- (1) The teacher understands the problems of communication, and
 - a. the method of communicating information verbally and visually, from one individual to another or group and vice-versa;
 - b. the sense (that is, sight, hearing etc) and their importance in aiding communication.
 - c. of specific aims and objectives in attempting to establish more effective methods of communication;
 - d. the environment and how it affects it;
 - e. ways of measuring how effective we communicate.

- (2) The teacher become familiar with the characteristics of those resources likely to be available to him / her as a teacher, by;
 - a. Introducing them to audio, visual and audio-visual aids in the classroom;
 - b. The way the individual items of equipment and material differ in operation and application;
 - c. Showing practical sessions in the use and operation of certain types of audio-visual hardware and software;

- (3) The teacher becomes aware both of the opportunities presented by the utilization of such resources, and the consequent Organization and other related problems, by;
 - a. encountering with the various types of audio-visual equipment, method and techniques which can be used by the teacher in the classroom;
 - b. considering the planning and organization necessary, prior to the use of audio-visual techniques into the classroom situation.

- (4) It helps the teacher to show appropriate levels of skills in the operation of basic

Audio-visual equipment, and in the preparation of simple teaching / learning Resources by;

- a. considering his/ her subject and selecting areas which he might regard as posing or problems to the learner and producing appropriate aids to overcome these difficulties;
- b. demonstrating the use of the above with the related piece of equipment. It is hoped, in view of these objectives, to maximize the individual competencies of student teachers in an attempt to leap from theory to practice.

CHAPTER TWO

COMMUNICATION PROCESS

Definition

Basically, communication means the transfer, transmission or exchange of ideas, knowledge, beliefs or attitudes from one person to another. According to Weaver and Shanmon (1949), the Word communication will be used in a broad sense to include all the procedures where one mind may affect another. This involves not only written and oral speech but also music, fine arts, concert party, “adowa” or kpanlogo” and in fact all other forms of human behavior

This implies the existence of people who have something significant to share with each other and that this sharing affects the way they behave. This also implies that there are many different media through which many people communicate, and language is only one of them.

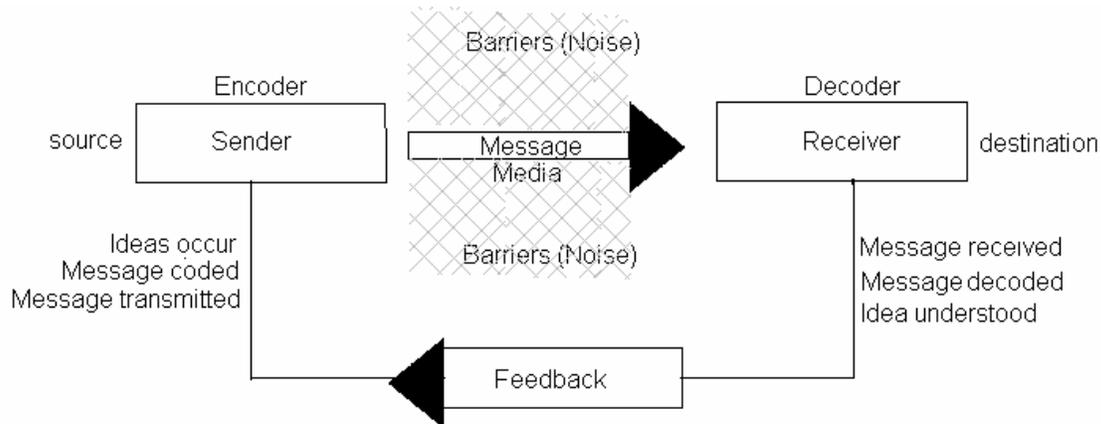
A ‘process’ has been defined as any phenomenon which shows a continuous change in time, or any continuous operation or treatment. On the basis of this, communication can be said to be a process. In fact, it is an activity that is on-going, dynamic and not static but continually moving. It has no fixed sequence of events, in that; it is impossible to talk about the beginning and the end of communication.

Elements of communication

Three fundamental elements have been identified as necessary for any form of communication to occur. These are the sender, the message and the receiver. Berlo (1990) forwarded a more complete picture of the process by identifying the following elements:

Source, Encoder Message Channel Decoder and Receiver

Communication system



According to him, any form of human communication has a source. This source could be a person or group of persons with a purpose or intent to communicate. This purpose by the source is in the form of a MESSAGE. The message is then translated into a CODE of a systematic set of symbols, which may be verbal, gestures, written, graphics, or any other form available.

Encoding

The encoder is responsible for taking the purpose and expressing it in a message. In human communication encoding is performed by a person's vocal mechanisms, which produce sounds, and by the muscle system, which produce bodily movements such as hand gestures, facial expressions and posture. The message is then transmitted or carried via a certain **channel**. A channel can be thought of as a medium, a carrier, or a message vehicle. In short it is the means through which the message is transmitted to the **receiver**.

The receiver is the person at the end of the channel for whom the message is intended. He then translates or decodes the message into a form that is useful to him.

Decoding. Decoding is done by the receiver's motor skills and senses; he listens, reads, thinks, evaluates and so on.

As soon as he understands the message, he reacts or responds to it in his own unique way. This response the source gets from the receiver is what is known as **feedback**, which is an additional necessary element of the communication process. In human communication the encoding of the message is performed by the source and the receiver respectively, the source and encoder are treated as one and the decoder and the receiver as one as well. In a lecture the teacher is almost always the source that initiates communication.

Giving a purpose which may be teaching students the operations involved in solving problems concerning fractions, the teacher through his vocal mechanisms and other muscle systems, translate his intentions in the form of a forty-five minute lesson plan.

He carries out his plan through the use of language, oral and written, and other visual and auditory materials or aid to convey his ideas, knowledge and others. The students, who are the receivers in this case, listen, interpret, evaluate, and assimilate the message in a form that they react or respond to. They may write notes, copy something from the board, listen intently, frown, (which may signify bewilderment or confusion) or even ask questions. These responses, which we call feedback, are important elements in the process because they enable the teacher (source) to adjust or re-construct his message to suit the existing situation. For example, if the teachers get feedback that indicates boredom, or confusion, he can stop and try another avenue for clarifying that part of the message, which elicited the said response. He can therefore regulate the rate of his speech, change his voice or vocabulary, or change the structure or the message.

If a teacher is not observant and resourceful, he may not be sensitive to consider what feedback he is getting from his students, and therefore may not respond to it. In this case, the teacher is not communicating; he is merely transmitting, which is not the true essence of effective communication.

Causes of communication breakdown

1. Inadequate verbal communication skills.

The most essential verbal communication skills necessary for human communication (face-to-face, interpersonal) are speaking, writing, listening and reading. Although the first two may be regarded as more relevant to the source, and the last two to the receiver, at some point in the communication process the roles of the source and the receiver may be reverted.

Adequacy in all four verbal skills is sufficient vocabulary and knowledge of the structure of the code (language) being used.

- a) Speaking needs additional skills such as correct pronunciation, appropriate voice inflection, good diction and enunciation as well as an accurate interpretation of feedback (verbal or non-verbal from the receiver).
- b) Writing needs additional skills such as the ability to spell words correctly and the ability to use punctuation marks in their proper places.
- c) Listening is probably more critical than reading in the sense that there is no way to satisfy what is heard or said because that sound quickly disappears, besides listening is not just a matter of hearing sounds but it involves catching the patterns of thoughts, and giving meanings to words and phrases. It implies therefore, that listening involves comprehension skills. There is a communication gap if the sender is limited in his ability to translate his thoughts, ideas or intentions into a message that would elicit the response he desires. Likewise, certain deficiencies in the receiver's verbal skills will affect the way he gives meanings and consequently the way he reacts or responds to it. When the receiver fails to understand the message or some portion of it, then communication breakdown results.

2. The Problem of meaning.

When communicating, it is important to recognize that the same word has different meanings to different people depending on their experiences and background, their patterns of thought, and their communication skill level. The words themselves have little or no intrinsic meaning. Their meanings lie with people who act on them. They also depend on the content in which they are stated. For instance, the word “silly” which an European or an Asian will take to mean “be serious” can on occasion be very offensive to a Ghanaian. In words, meanings can be transmitted because they are not in the message but in the receiver.

Serious communication breakdown can be attributed to the false assumption that people have the same or similar meanings for identical things. What is suggested here is that two people can never have the same meaning. They can have similar meanings only to the extent that they have had similar experiences or are expected to have similar experiences. A man who has taken part in a battle will give a different meaning to the concept of war than somebody who has never seen a gun fired.

3. Contradicting verbal and non-verbal behaviors such as facial expressions, hand gestures and posture changes which in themselves give out certain message.

When verbal and non-verbal messages contradict each other a feeling of uneasiness or confusion is aroused. You may be saying “I like your shirt” but your facial expression shows a look of distaste or aversion.

4. Noise Miscommunication sometimes results because of some kind of interference in the reception of the message. This may be caused by noise such as shouts and laughter of children playing in a nearby play ground, hooting or horns of cars passing by or even the buzzing of a bee.

In the classroom, students may create unnecessary noise by shifting their feet too often, dragging their chairs, coughing, tapping their desks with their pencils or even dropping their cutlery sets. In any case, noise which distract receivers from listening

can disrupt the sources train of thought causing him to falter in his speech or to stop because he has forgotten what he was saying

Improving classroom communication

Effective teaching implies effective communication. Hence there can be no separation of the goal to improve teaching and the goal to improve communication.

Suggestions

To avoid physical barriers to perception...

1. Make an effort to improve on your speaking ability or skill. Learn to speak in a direct, confident, friendly and conversational fashion. Make your words alive by accompanying them with appropriate gestures or the body, head and arms movements. Vary the tone of your voice and the rate of your speech to obtain desirable effects. When speaking, pronounce every word distinctly without yelling or without using too much energy.
2. Try to eliminate possible noise that might distract students' attention. If they cannot be avoided, try and overcome them by speaking louder than normal or better still by engaging the class with other activities that do not involve listening.
3. Present well labeled diagrams and legible writings that are visible enough even for the last student at the back of the class to see.

To avoid psychological barriers to perception...

1. Plan and organize your message (that is, your subject matter) in a concise, logical and easy to understand manner.

Aristotle's suggestions in the art of persuasion may apply here. According to him a discourse should be divided into three clear sections,

- (a) introduction: Tell them what you are going to tell them;
- (b) The argument: Tell them; and

(c) The recapitulation: Tell them what you have just told them.

The ability to recapitulate could be very useful and even necessary because no matter how keenly your students attend to what you are saying, their attention may wander due to physical or mental fatigue or some kind of noise.

2. Assess the needs abilities and possible interests of your students. Do not take it for granted that because something is interesting to you, it will be interesting to your listeners.

3. Be a good listener, listen attentively to students' questions, answers or comments. They become more interested and satisfied if they know that you too consider what they say.

4. Beware of students taking attention. This is a common habit among students. They try to appear to be listening when their minds are somewhere else.

To avoid Intellectual barrier to perception.

1. Adjust your choice of words, concepts and explanation and probably examples to suit the student's level.

2. Try to avoid technical and difficult materials. If they cannot be avoided, explain them thoroughly in terms that the student can understand.

3. Move at an average pace in the delivery of your lesson to make room for the slow learner.

4. Avoid using foreign language in the classroom. Do not assume that since you are operating in the region of a certain tribe, all the students can understand and interpret the language spoken by the natives of that region. Most classrooms are homogeneous in nature and as such an approved language should be used.

CHAPTER THREE

INSTRUCTIONAL MEDIA

Before discussing the types of instructional media, it might help to understand what is meant by the term Instructional Media. As has been pointed out in the hardware implication of educational technology, the devices used to transmit, amplify, distribute, record and reproduce some sort of stimuli in the teaching and learning process are termed Instructional Media – a medium through which teaching instructions are used to send the message to the students.

Instructional Media are therefore any physical devices used by the teacher as added means of communication to help learners learn. It can also be said to mean all devices and materials used in the teaching process. They are used in conjunction with instructions when explaining a principle or demonstrating a skill. It is important to remember that they are an ‘aid’ to learning and teaching, not a substitute.

Giving form to thought

Whenever one talks, the words use are arbitrary symbols that represent whatever is being said. With visual aids, words acquire a more concrete meaning. Words are the expression of thoughts; sense of imagination is used to form a mental picture of the ideas that spoken words intend to convey. When they are written, words and symbols must be understood again to form some mental images of the idea that they mean to convey. Many scientific principles from which many industrial processes are developed require abstract thinking. The ability to think in the abstract varies greatly among students. Past experiences, educational backgrounds, and the individual abilities of students are reflected in their ability to think in abstract.

As a result, communication especially in teaching, assumes major importance. Instructional media are used to communicate by adding realism and substance to ideas, descriptions, and explanations used in teaching. Well – designed and well – constructed

instructional media appeal to the eye. It is important to note that most of what is perceived comes through the sense of sight.

The use of senses in learning

Studies Show that every person learns to a high extend by receiving information through the sense organs such as the ear, eyes, nose, mouth, muscle and tongue, hand and skin. It is also known that students learn skills, concepts, and ideas better when they try then in practice. The old adage that practice makes perfect therefore has a sound scientific basis.

Sight is put to good use when using instructional media. Sight is put to a better use when combining hearing and seeing and explaining concepts in diagram form. Studies have shown that most people learn only 10% to 15% of what has been read and that is provided the subject is clearly expressed in simple or appropriate technical language that can easily be coded. Again, most people learn 20% to 25% of what is said when the voice is clear. This percentage assumes that the audience is willing and paying careful attention to what is being said. It also implies that the voice is crystal clear and free from any form of distortion. Most people also learn 30% to 35% by seeing more if the objects, symbols or representations are carefully designed and relevant. This also depends on the extent to which the learner will pay attention and hold this on for the time duration of the presentation for effective assimilation of the facts. Most people learn 50% and more from seeing and hearing together, provided that the two senses are coordinated. Finally, most people learn to about 90% if they participate fully in the sessions which uses all the senses.

This implies that the senses are very important when it comes to teaching and learning. To be able to achieve the best results from your students, you will have to make use of all the senses as much as possible. You must examine your teaching methodology and apply techniques that will cause students to be willing to be part of the teaching; you must make sure that your teaching makes full use of the senses of sight and hearing in all

situations. More so, you must give notes in the form of hand outs (and not text books) to your students so they can easily understand what you intend to put across. You must not lose sight of the fact that your voice can make a lesson interesting or mar it entirely. An interesting voice can sustain and cause a will in students to hear as a result, they pay maximum attention in class. Finally, you must involve your students in class activities so that they can master what has been learned.

Without the integration of the senses in teaching, the lesson becomes mind-numbing which causes exhaustion in students and they lose control of themselves. The short-term effect is that most of them will sleep in the class or want to play. The long-term effect is that the students play truancy when it comes to your turn to teach.

To integrate the senses in teaching:

1. Include in your lesson, the most appropriate instructional materials
2. Polish your voice just as the chorister does.
3. Vary the tone of your voice in class laying emphasis where it is due either by making it firm or slow.
4. Use gestures as much as possible in your teaching
5. Watch out for non verbal communication signals in your students.
6. Work within the norms acceptable in the school and use that to your advantage.

Instructional media as a supplement to teaching

It cannot be over emphasized that instructional media are simply aids to teaching. That is they supplement instruction; make instruction concrete; motivate learning and stimulate interest. Instructional media are necessary at all levels and stages of teaching. It is necessary in introducing the real thing as a prerequisite to actual job application however if the real object is not available a good substitute will work equally well.

The use of instructional media is limited only by the ingenuity of the teacher. This is essential because the teacher can fail miserably in his teaching responsibility if he relies heavily on instructional media as a means of teaching.

Instructional media can be used in all parts of the lesson or session, be it ...

- 1 Introduction
- 2 Presentation
- 3 Application
- 4 Conclusion
- 5 Revision
- 6 Assignment.

Instructional media are used sparingly so as not to mess with the teaching and in the end confuses the students. The teacher should use them when he or she sees a need to use them in situations when ...

- 1 The topic to be taught is presenting difficulties to teacher and or students
- 2 When the teacher sees that his or her class is becoming boring and inactive
- 3 When the teacher is not conversant in the area of operation
- 4 When there is no other way of presenting the idea than to use an aid

Instructional media as a means of variety

Studies have it that, in change there is rest and variety is desirable because it brings change into the teaching environment. It is refreshing to students and stimulating to the teaching. It actually offers relief from monotony and keeps interest high. That is not all; variety can cause you to adjust to difficult situations. One method may not be successful with a certain group, while another may get the message across. It causes the teacher to be flexible in his teaching and this causes the teacher to present information in diverse ways. New devices are being developed and introduced into the system daily. And new ways of using media are being discovered. Of course not all media are of the commercial type; the teacher can develop many fine media. Exceptional situations can

occur in teaching and the teacher would have to design and make media when commercial media do not exist or are not readily available. For example, it is fine to talk of using charts and models, but if none exists on commercial basis, it is possible to design and construct them your self. It is also possible that several media should be used in reinforcing teaching when the content of teaching is complex or when there is a need for the highest degree of understanding.

What instructional does

By using instructional media, inaccessible processes, materials, events, objects, and changes in time, speed and space could easily be brought to the classroom. Teachers often face difficulties in making information available to students in certain cases. Students in a large room may not be able to see the demonstration, small objects, objects and small pictures shown by the teacher: Further, the teacher may not be able to show microscopic things to the class. Audio-visual materials can help the imaginative teacher to solve these communication problems. Motion pictures using remotely controlled cameras, employing slow motion and time lapse photography techniques, technical animation, etc., closed circuit television equipment, slide – tape presentations and the like, can always be used to advantage.

Instructional media provide freshness making both teacher and students active and healthy through out the teaching period. It allows the teacher easy and repeated reproduction of teaching events or procedures. In a way instructional media has a way of appealing to students of varied abilities in the class because it provides visual access to a process or skill. One very good thing about instructional media is its ability to promote an illusion of reality. As a result, it widens the range of students experience through filming and encourages students to actively participate in class. Instructional media can also;

1. gain and hold attention of the learner
2. focus attention or highlight key points
3. ensure order and continuity of thought
4. create impact

5. save time by avoiding wordy explanations
6. facilitate understanding of abstract concepts
7. make lesson more standardized
8. improve quality of learning.
9. overcome the limitation of the classroom by making the inaccessible accessible

Because of these numerous advantages of instructional materials, communication is meaningful hence effective teaching and learning. As a result, students have better retention, which makes learning more permanent. To reduce the waste in teaching, you must use instructional media in your teaching career.

Other schools of thought

However, these do not come with their associated problems. There is the feeling by some teachers that unless the teacher teaches and makes the students listen, no learning will take place. Some teachers also complain that they have heavy load schedules that they have little time to produce instructional media. Others have the feeling that the use of other methods of teaching are unnecessary since some of them have succeeded with the traditional method over the years. There are those who also say that it is the responsibility of the school authorities to cater for expenditure on audio-visual aids. Heads of departments are also saying that school budget does not cater for expenditure on audio-visual media. Some teachers feel that students are incompetent to handle instructional materials for independent learning and others complain about the difficulty in storage, maintenance and replacements of these materials and devices.

Selecting instructional media

The biggest challenge that faces teachers in the classroom is how to select the most appropriate teaching methodology and instructional media to compliment his methods. Some say they don't know what media to use. Just as the educational process is influenced by many factors, so is the selection of instructional media. Among these are;

1. the task to be learnt and the teaching method selected

2. characteristics of the learner such as experience, interest and motivation
3. characteristics of the teacher such as that person's skills, attitudes and preferences
4. material factors including economic constraints as well as cost, time, availability, ease of use and maintenance of the media chosen. These are interrelated factors that can affect the selection of the media.

Considering the factors influencing the selection of media, one should decide on a few that are feasible. From experience, the novice teacher tends to use too many instructional media leading to confusion among students and at times the teacher himself. On the other hand, older teachers tend to resist tried out new technologies and tries to stick to the old, tried methods, which inevitably prove unexciting. Acquiring or producing media is a tedious and expensive process. It is important; therefore, that bad management of the media does not waste effort and money.

Evaluation of media

Media evaluation is an indispensable part of teaching. Instructional media should be evaluated at the completion of its production and during its use. At the production stage, the following point should be determined whether;

- 1 the materials meet the original objectives;
- 2 content and technical aspects meet the expected standards;
- 3 the material is of suitable length, and information flow is smooth;
- 4 if there are any gaps, errors, inaccuracies;
- 5 the particular medium will integrate with other media. To evaluate media, you should seek information and accept criticisms from colleagues, technicians, former students, administrators, and models from books.

For evaluation instruments, structured interviews or questionnaires can be used. Below are some designed questions that can give helpful answers. For instance:

- 6 How well do students accomplish the objectives upon which the media are based?
- 7 Do reactions indicate that the medium appeals to the class or to individual students?
- 8 If the media do not meet the objectives or if they lack appeal, what revision can be made?
- 9 Are the arrangements for use of the media convenient for you and your students?
- 10 Was any difficulty encountered in using the equipment?

On the basis of your answer to these questions it is important to revise the instructional media and/or the way to use them.

Practical examples

To evaluate these media, it is necessary to consider:

- | | | |
|-------------|--------------|------------------|
| *clarity | *size | *move ability |
| *colour | *language | *attractiveness |
| *legibility | *relevance | *appropriateness |
| *simplicity | *correctness | *accuracy |

Conclusion

For the improvement of teaching methods, all concerned should play a major role in making it possible for audio-visual aids to be used in schools at all levels.

1. Courses should be organized for development and use of Audio-Visual Aids
2. Educational authorities should provide funds for courses and production of Audio-Visual Aids
3. Heads of institutions should provide facilities for production of Audio-Visual Aids

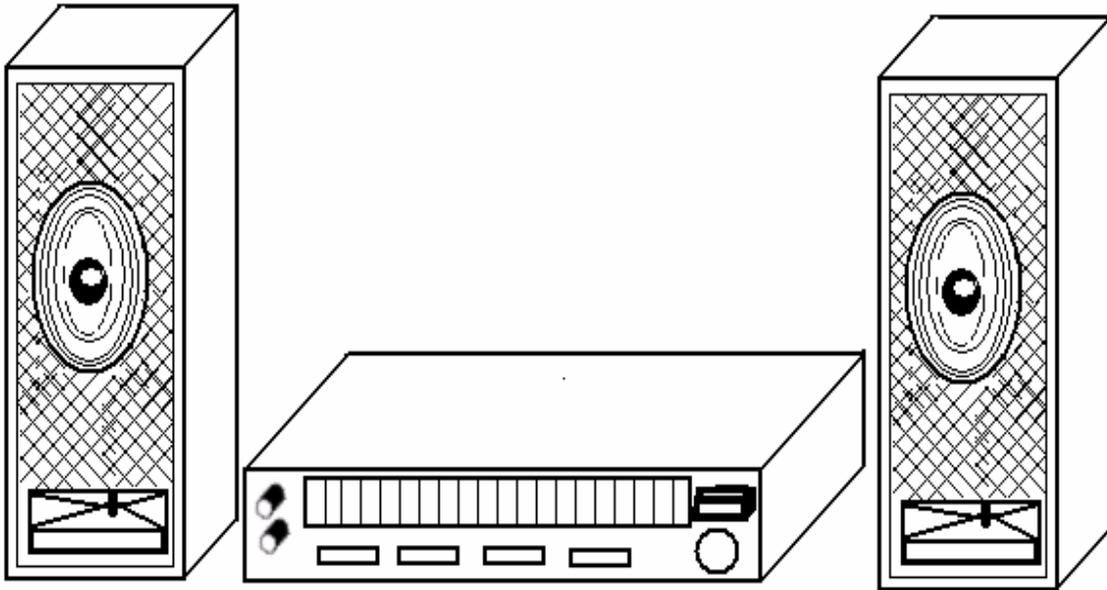
4. Heads of Departments should encourage teachers to produce their own Audio-Visual Aids.
5. All teachers should be encouraged to produce Audio-Visual Aids at least four in a term and use them. They should also attend courses in Educational Technology.
6. Students should be encouraged to make use of all available media in the school.
7. Educational Technology should be taught in all Teacher Training Colleges.

Assignment 1:

Educational technology as means of hardware should be taught in our teacher training schools. Discuss.

CHAPTER FOUR

AUDIO AIDS



In recent times almost every household can boast of at least a radio set that educates, entertains and informs members of the house. The youth are found with smaller sophisticated systems hanging around their waists and in cars, almost every driver decorates his vehicle with a number of speakers that would produce good sound from car tapes. So naturally these gadgets are very common and are not new items to students these days. These systems vary from hand-held recorders to sophisticated multi-component systems and compact disc (CD) players. What this means is that audio tapes can be brought into the classroom as an instructional medium to facilitate the teaching of certain topics.

In the language laboratories, it can be used to improve on the use of a particular language, in teaching secretarial duties, it serves as an important gadget in dictating words that should be written within specified periods, in the technology classroom, it can

be used to give instructions on jobs or operations. The teacher can also use this to record his teachings and use them for revision purposes or for self- instructions by the student. Again, the teacher can use this to amplify his or her voice especially when in a large classroom. Audio devices now come in different forms; there are those who still use the reel-to-reel tape recorders, cassette recorders, gramophone or the compact disk. These are worth talking about.

Instructional audio aids are programmed to supplement the teacher's effort and resource by transmitting his teaching on air for the targeted audience. In Ghana, there was a time when radio broadcasts were made available to schools at approved times in order to facilitate and supplement what has been taught in the classroom. Schools that took interest in this programme planned their time table in such a way that students were seated in front of the school's radio at the stipulated times to listen to the educative programmes. In the universities, lecturers are encouraged to present their lectures on air for their students.

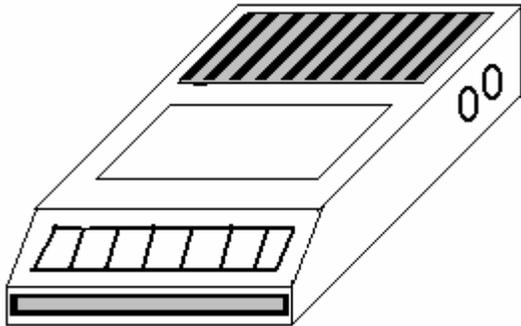
Instructional aids can be used to teach every subject under the sun. The greatest disadvantage is that it needs the targeted audience to pay attention at all times so as to keep in pace with the teaching. In live educational broadcasts, students can phone in to ask questions for clarification. Students can stay in the comfort of their homes and tune in to the lesson or can go about their normal routine duties with a handy walkman. Because students will have to pay attention at all times, it helps to develop students listening skills and critical thinking abilities. One good thing about this technology is that, experts on the job can be called in to discuss issues or talk about specified issues and which can aid in understanding concepts.

Audio recording formats

Reel tapes: these are recordings made on flexible magnetic tapes. Originally, the tapes were in open reels and this made its handling difficult since the tape could easily be destroyed in the process of threading if absolute care is not taken. It could be possible

that because of this problem a new design was made and in this, the loose tape is enclosed in a case usually called the cassette.

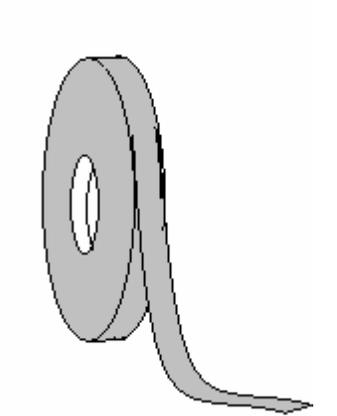
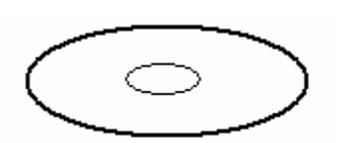
In this format even the toddler in the house could play with it without destroying it. The open reel tapes are used these days to produce the initial recording in media production for high quality tracks in studios or in other fields.



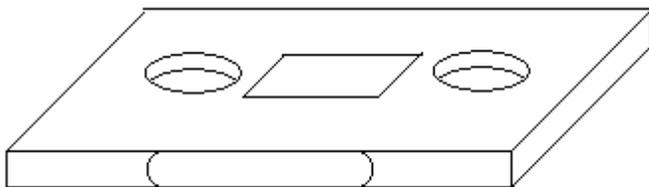
Disc recordings: The old phonographic record (turntable or monograms) are giving way to more sophisticated designs called the compact disc (CD).

This format gives out very good quality sound and selection of which type of sound needed on the disc is easy to locate. This is made possible by a laser pin as in the case of phonographic plates. Audio cassettes and CDs can be used to pick information during lecture periods for replay. Also sounds of machines, birds, speeches, drama etc can be captured and used for teaching purposes. In well-developed educational resource centre audio records are equipped to automatically advance slides or filmstrip programs

such that the teacher no more does the talking when slides are shown. This is made possible by a unit that synchronizes both audio and picture slides at a given time or space.



An instrument for intensifying feeble sounds or for transmitting sounds is either fixed permanently in the recorder or can be connected to the machine by connecting cables. There are different types of these instruments usually known as the microphone and each type has its purpose.



How to make conversational recordings.

- (1) Load cassette into recorder (a)
- (2) Plug in microphone (where necessary) (b)
- (3) Press recording knob and pause knob simultaneously
- (4) When ready to make recording release pause knob
- (5) Make conversational recording (preferably from microphone)
- (6) Stop or press stop button at the end of recording.

Using tape recording as a public address system (PA)

- (1) Switch recorder to PA position
- (2) Plug in microphone
- (3) Press play, record and (pause controls if necessary)
- (4) Adjust microphone volume control knob for desired sound output.

ASSIGNMENT

1. Make a recording of a teaching process. Relate this to your field of study or specialization

2. Explain five conditions under which would you prefer to use a public address system for your teaching?
3. When will it be appropriate to select a tape recording for teaching a course in your field?
4. When will the tape or CD be considered as very important instructional media for a topic in secretarial duties?
5. To what extend can the audio aid be used for a topic in Accounting principles?
6. How can language laboratories be of very useful help to the UCEW-K student?

CHAPTER FIVE

STILL PICTURES

Still pictures, as the name imply refer to pictures that are motionless as opposed to the moving pictures of the television and the cinema. They are often regarded as a form of “universal language” in that, they are understood everywhere. Thus, one does not need to be able to read or speak a certain language in order to interpret the message a picture conveys. This does not deny the fact that an individual’s interpretation of pictures depends to a large extent on his background as well as his past experience on the subject.

Definition

A still picture is a two dimensional visual representation of persons, place, or things. Examples are photographic prints, sketches, illustrations, cartoons, murals, cutouts, charts, graphs and maps. In the classroom, still pictures play a major role in sending the intension of the teacher across to the student.

However, still pictures that are used in the classroom must be carefully selected so as not to cause any form of frustration to the student. Pictures for instance are excellent forms of presenting the real thing in its real form to the student but when this picture intended for the student has more information in the background to it than expected, the objectives are defeated.

Pictures may be used for individual study, for display on bulletin boards and adhesive boards, in exhibits. Still pictures can be presented for different reasons. Slides (for projection) can be used to present information to large audience or to arrest the attention of the audience. Posters can be used in the workshop to alert students working in the workshop; charts can be made available in the classroom to inform students about the details of a fact. Tiny things can be enlarged to show the details that the students are expected to understand. Large ones can be reduced which makes independent study possible and convenient, stick drawings can be used on chalkboards to make some abstract descriptions concrete.

Still pictures are flexible. A teacher can use them in any manner he wants. He can vary his speed or his techniques of presentation in accordance with his purpose as well as the ability of his students. For old students, pictures can provide a means of correcting misunderstanding and also a means of enriching knowledge and information acquired from words, printed or oral.

CHARTS

A chart is an information on a large sheet of paper or hard cardboard. This is usually mounted on the chalkboard or similar surface in front of the class. A necessary tool to use with the chart is the pointer.

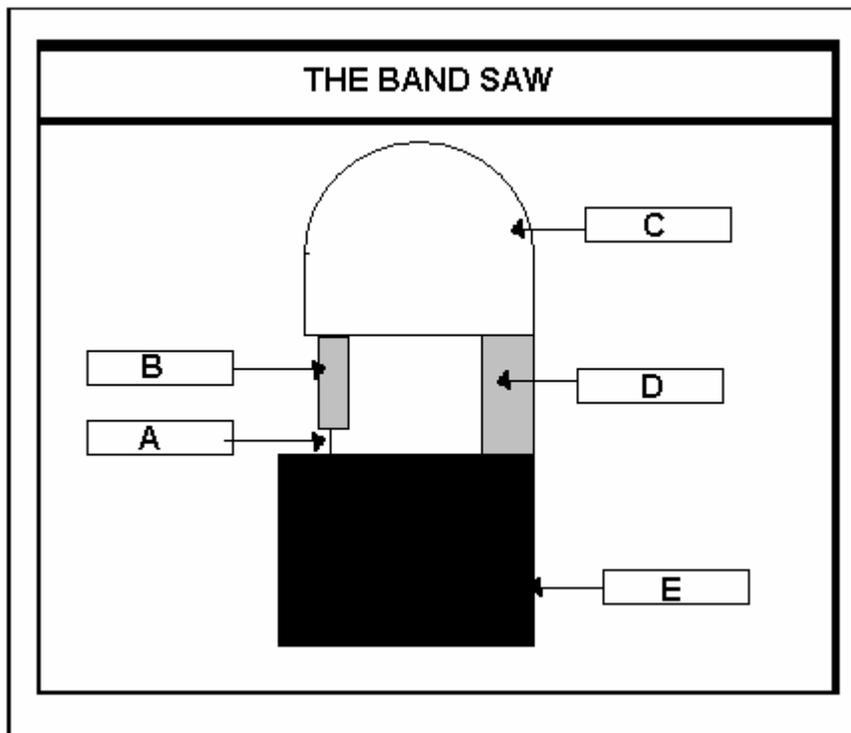
Any visual information developed on the chalkboard by the teacher in the presence of students is bound to be most effective. This may not be possible because of practical reasons. The picture to be drawn may not be simple and may have too many details and therefore much time would be wasted in drawing them on the chalkboard. Also not all teachers may have sufficient drawing skill to draw presentable pictures or diagrams. For these reasons, a chart is of much help and handy to the teacher.

This will save a lot of teaching time and the same chart can be used over a number of years provided the information on it is still relevant and accurate. There are a lot of ready-made charts but where it is difficult to lay hands on one due to lack of funds or availability, the teacher can readily prepare one. In fact a teacher will find a chart prepared by himself incorporating his own ideas and lines of approach of the specific topic more useful to him than a prepared one that may have a lot of unnecessary details.

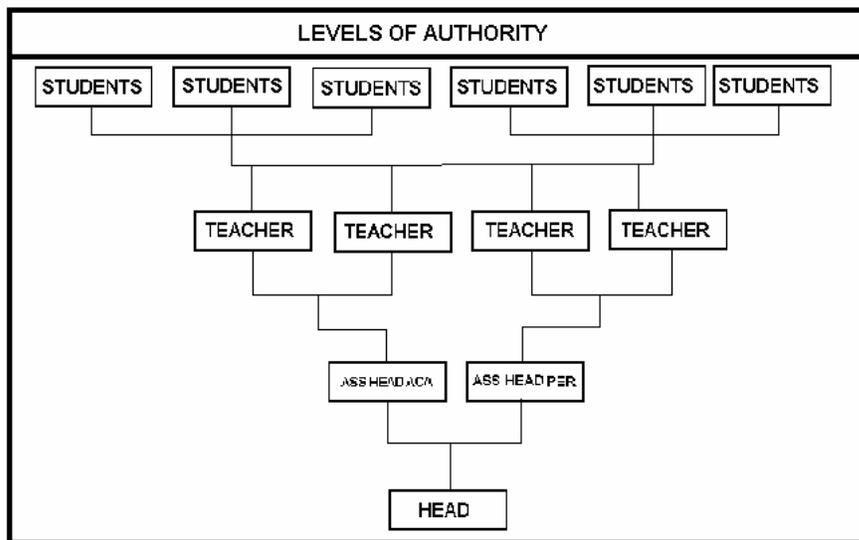
Types of charts

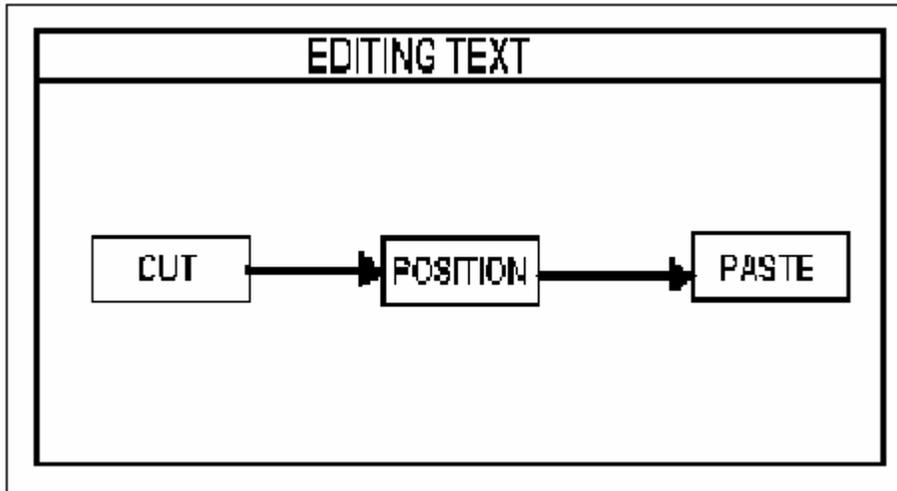
Information on charts comes in different forms as a result of the idea to be presented. To talk about a part of a tool or object will cause you to design a chart that would look different from a chart that would be used to present an idea of a process. As a result, there are different types of charts that can be used in the classroom.

1. Outline chart – usually used to present the outline drawings of objects.



2. Tree chart or organizational chart – This may contain information about organizations of a government, institution, etc in their levels of authority.





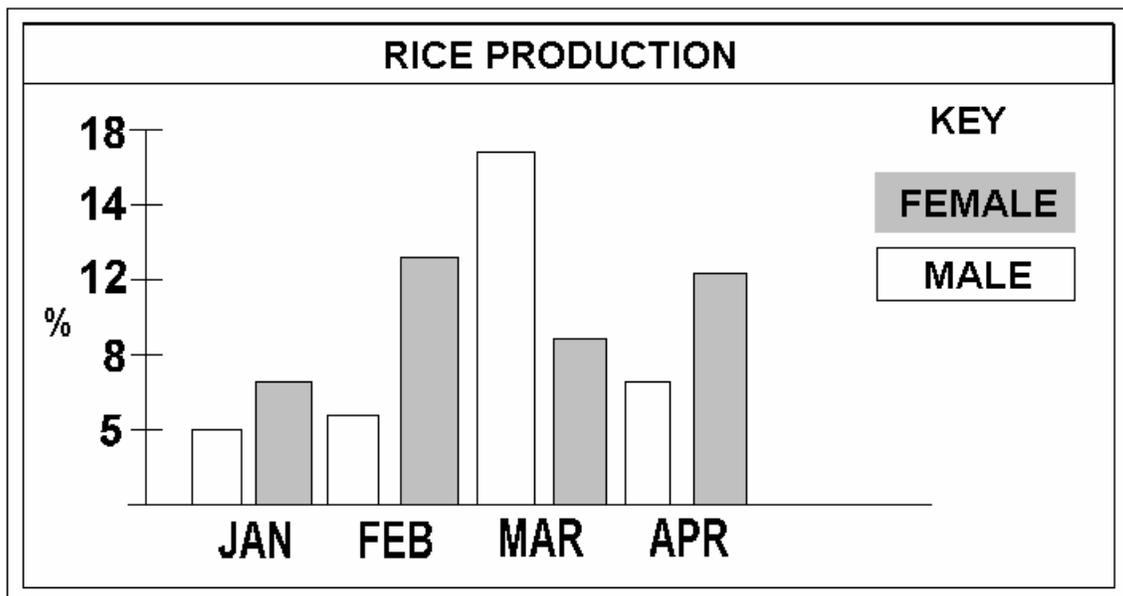
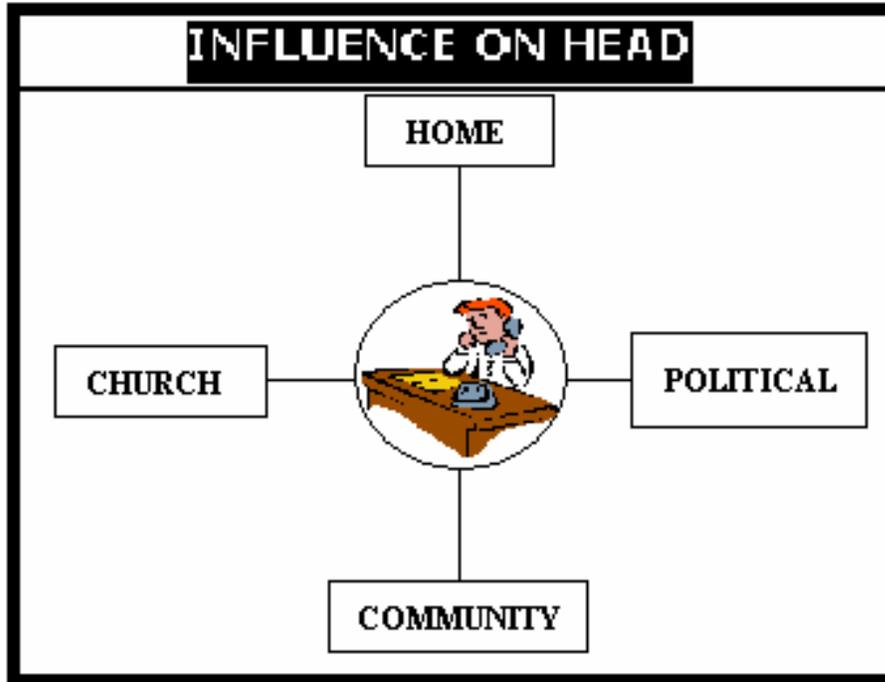
3.

- 4) Flow chart – This may contain information about manufacturing processes etc. An example can be the manufacturing process of cement.

4. Flip chart – This chart has series of leaflets containing visual information about the same area of knowledge. Example, good grooming.

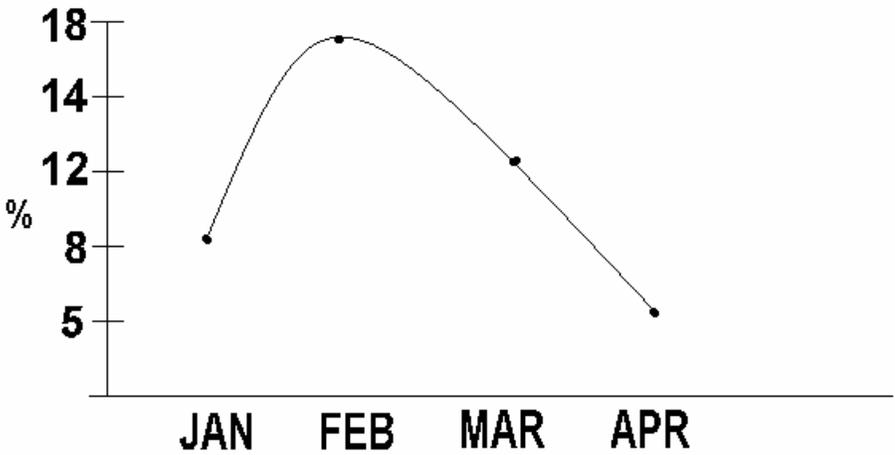


5. Stream chart – shows the functional relationship between the different aspects or parts of a unit, process etc.



Types of graph that can find a place in a chart are the bar diagram, line graph and pie chart.

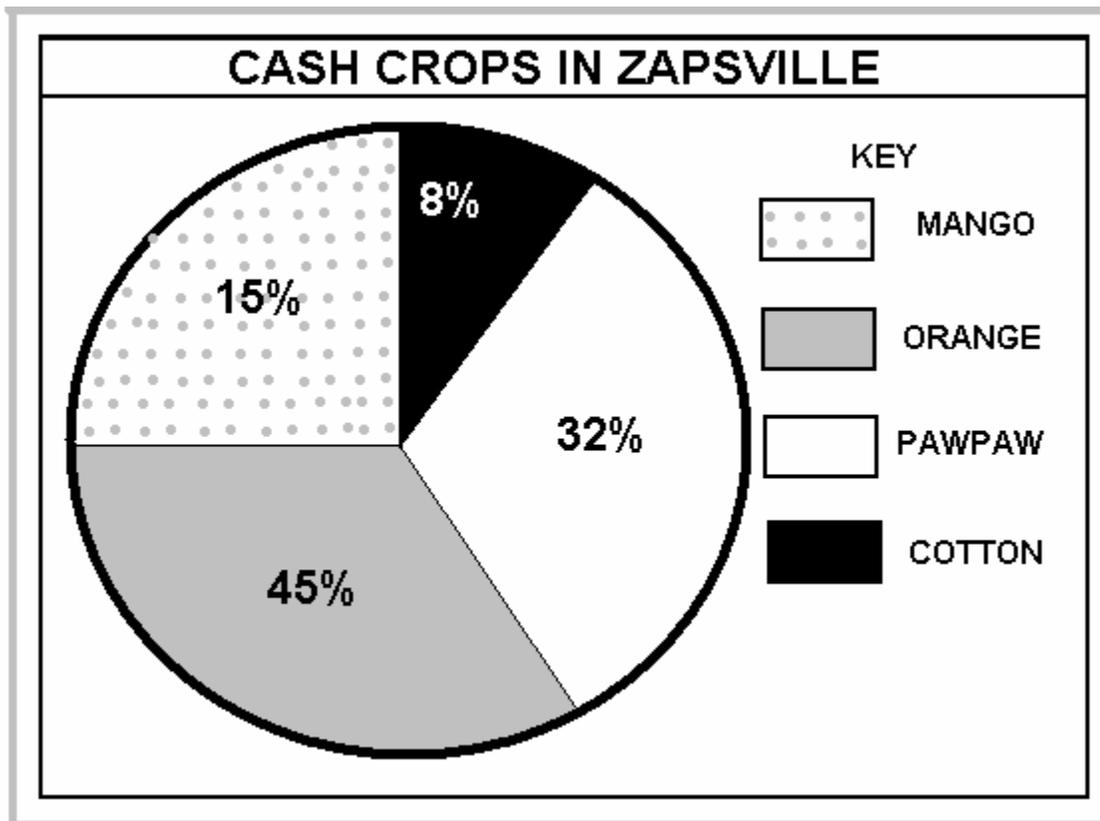
RICE PRODUCTION



Reasons for using charts

The following are the specific objectives of using charts.

1. To present materials symbolically
2. To show continuity in a process
3. To present abstract ideas in visual form
4. To show development of structures
5. To create problems and to stimulate thinking
6. To motivate the student
7. To show relationship by means of facts, figures and statistics.
8. To summarize information



It therefore implies that a chart can be used at any stage of a lesson be it;

- I. Introduction
- II. Presentation
- III. Application
- IV. Conclusion or
- V. As an assignment

The planning and preparing of charts must be made bearing in mind the following points

1. Concept or theme to be developed in the chart. This can be obtained from the stated specific objectives of the lesson
2. Analysis of the main theme in various relationships, which are to be developed
3. Planning of the information layout to include diagrams and lettering.
4. Colouring, if necessary
5. And bear also in mind the characteristics of a good chart.

Characteristics of a good chart

1. It must be bold and legible. Here, information should be large and every detail depicted should be visible
2. Must appeal to the student
3. Must convey only one idea at a time
4. Must attract attention
5. Must have good picture quality, good composition, and good contrast / sharpness
6. Effective colour must communicate the idea clearly
7. All information must be represented accurately (projecting information and tracing) it is easy way to make a large chart or diagram from a small illustration.

Using the episcope can enlarge a small picture. The outline of the project picture should be traced with a pencil before finishing with ink or felt pen. The overhead projector, slide or filmstrip can also be used. Similarly, a pantograph can also be used to enlarge or

reduce pictures. By using the grid method, a picture can be properly proportioned, elongated and distorted purposefully.

Tools for preparing charts.

1. 2H pencil
2. An eraser
3. Poster colour
4. Stick – ons
5. Cardboard
6. Felt pens
7. Water colours / brush
8. Straight – edge / ruler

Lettering

A lot of lettering goes into chart preparation. There are different styles of lettering and the use of a type depends on you. However you must choose a chart that will attract the attention of the student and also it should be readable. Some styles are so over exaggerated that they are not appropriate for lettering on charts.

*The type you see here is
good enough since you
can read the characters
clearly.*

**But his is much better
to read and even the
toddler who has just
begun to read can
easily understand the
letters.**

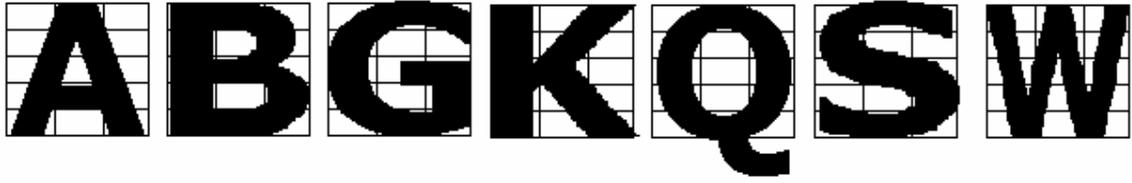
Practice how to write and try to master it since you will be doing a lot of the lettering yourself.

A B G K Q S W

A B G K Q S W

Freehand lettering

If you think you cannot write straight, use grid lines to guide you. The grid can also help you to write block lettering with ease.



Block lettering

There are other types of lettering that can also be used and you can equally use the grid as guide.

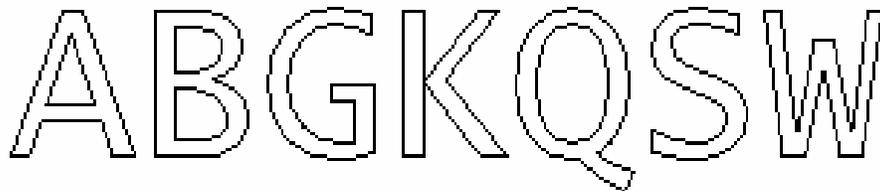
ABGKQSW



Letters with serifs

ABGKQSW

Letters without serifs



Outline of letters

ABGKQSW

Letters with shadows

ABGKQSW

Calligraphy

Preserving charts

It is important to preserve charts for future use. To do this,

1. Keep all charts flat
2. Reinforce edges with masking tape or PVC adhesive tape. This at the same time provide a simple border
3. Protect surface by spraying shellac varnish
4. Or by lamination
5. The chart can be framed
6. When a chart is to be used in a classroom, the teacher should make sure there is provision for hanging the chart at a vantage point.
7. Peg board clips, gummed hangers or glue magnets, magnets and magnetic strips can be used to hang charts

Do not hang a chart on writings on the chalkboard.

BOARDS

There are a number of boards used in the classroom. The most important and common type to Ghanaian teachers is the chalkboard. Conventional white chalk is used on a black or green surface. The other boards to be discussed later are the adhesive boards (magnetic board and flannel board.)

Chalkboard

The chalkboard is a visual aid with a reasonably smooth surface and used as a visual voice by the teacher. This is usually displayed in front of the class for the purpose of writing and producing sketches, illustrations; summary and for building the scheme of a lesson as it unfolds. A word or sentence recorded on the chalkboard provides an emphasis, which may be lacking in the spoken, “Do not forget this” or “pay special attention to this”.

Characteristics of an effective chalkboard

1. It provides maximum contrast between background and line drawings or written words. In short the surface “holds” a good chalk image.
2. It eliminates glare. A monthly wash and a termly coat of renovator will help in clarity. However, the use of batteries is not the best.
3. It must have a matt surface.
4. It must easily be erased or cleaned without leaving “ghosts” or smudges
5. It must be mounted in a way that will cause it to be within easy arm’s reach of the students. Its positioning should vary depending on the age or average height of the students using it
6. It must have a good light so that all work can be seen without strain.
7. It must have a wide surface area.

Utilizing the chalkboard

To be able to overcome some of the communication barriers in the classroom, it is necessary that the teacher learns to create concise and dependable chalkboard visualizations to illustrate his meaning.

Tools used on chalkboard

A reasonable variety of simple chalkboard devices are available to help the teacher in his effort. These include T – squares, perforated charts, templates/stencils, episcopo OHP and slide projectors, pointer, grids, chalk, cleaner etc.

Effective use of the chalkboard



For effective board work, it is often useful to have one board on which the lesson summary can be developed and another for illustrations and explanations. Maybe a third can be placed at a vantage point for students business. This will be in the ideal situation. However the traditional chalkboard (easel) cannot be used in this situation. There is therefore no hard and fast rule in using or organizing the board in such a manner that would make teaching / learning meaningful.

All the same it is necessary to consider the ideal chalkboard, a board of about the size usually in front of all the lecture halls at the University College of Education – Kumasi, Sunyani and Ho Polytechnics.

The ideal chalkboard can be divided into three parts with the center portion twice the size of both left and right parts. In this particular situation, technical words, key words definitions can be given extra force if they are written on the left part of the board. This gives definitiveness to the presentation and is an implied invitation to the students to note these. Once such words have served their immediate purpose they should be erased.

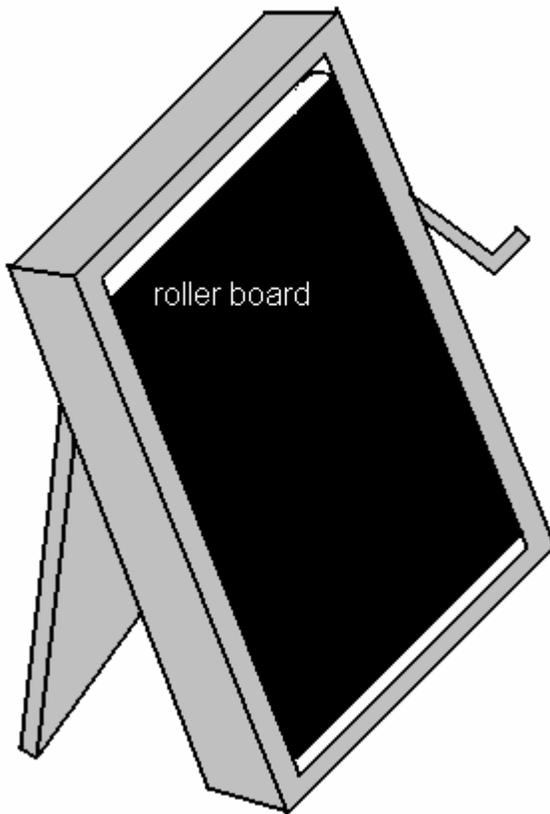
The center part can be used for summary of the lesson. A place where the board is blank from the beginning of the lesson and filled up at the end of the lesson. Note, problems and their solutions should remain on view for as long as the students are using them. Their transience gives emphasis to the dynamics of the learning and gives that a major prominence. At the end of the lesson, this can be the focus for teacher's recapitulation.

The third part can then be used for students business. In such an arrangement the students with time turn to realize the importance of each part of the board and treats each part with the urgency it deserves.

As stated earlier on, it is very difficult to generalize over so versatile an aid but as a rule.

- 1 It should be planned in advance and cleaned when it is not in use.
- 2 For emphasis it should be uncrowned.
- 3 Colour may be used sparingly
- 4 Outstanding words can be printed in capital letters, boxed or circled or coloured or even arrows directed to them
- 5 Abstract ideas can be represented by shapes, people by stick figures and quantities by size.
- 6 Where a complicated drawing must be made on the board as the lesson proceeds it is wise to prepare it before the lesson and then almost erase it or use chalk dust to line out the diagram from a perforated chart. The teacher can then see the faint outline but the students cannot. This technique is very good especially when the diagram is very complex and students would need to understand each part of it through the build – up method.

- 7 In the most appropriate sense, complex diagrams should be duplicated on hand – outs and presented to students for close study after the lesson has been treated on the chalkboard.
- 8 Complex diagrams can be projected using slides, opaque and overhead projectors before the lesson begin.



Designs

There are quite a number of chalkboard designs ranging from the easel to the most complicated type like the roller board. It may be proper to give some examples; wallboards, sliding board, folding board, roller board, and easel and rotating board.

Chalkboard techniques

For success in using the chalkboard, planning what will

be displayed and employing simple preparation techniques are important considerations.

1. Plan your presentation in advance so that you know what you are going to put up
2. Clean the boards before you begin. Ghost marks of a previous work may distract the attention of even a willing group.
3. Use colours to emphasis key points, decide what colors you are going to use, and why you are using them. (Examples, yellow / green for fruits, etc.)
4. Write standing to one side as your back may hide the board if you write to yourself.
5. Write legibly; press heavily, so that you lines are thick. Fill the board and do not economize on space
6. Build explanations on the board, point by point, as the presentation proceeds.
7. Use tools to improve on effective teaching and better understanding of lesson. A template made of plywood or heavy cardboard for tracing complex regular shapes will make teaching proceed at a faster rate.
8. Clean the board at chosen intervals, but of course, with permission from the students.

There is no doubt that, when used skillfully, the chalkboard can combine the eye and ear as effectively as any other visual aid in conveying a message through mulit-sensory channels. But is it the most modern and easiest way of doing the job? Communication study seems to indicate that it is not. For if students need to be motivated, trained quickly or reduce cost, there are other means almost as cheap as the chalkboard and which are easier to use and have much more impact.

Advantages

1. It is available in almost all classrooms, even in the most remote cottage.

2. Its cost of construction, is moderately low
3. And also easy to construct
4. It can take information with relative ease
5. Materials can be erased as and when necessary.
6. The tools for writing are readily available and low in cost
7. No technical complexities.

ADHESIVE BOARDS

To modify a diagram on the chalkboard, you need to rub out a part and draw it again but this is not always possible to do quickly and it may not always be desirable.

For this reason, other types of boards are used to present such diagrams, which are called mobile pictures. Wherever a change or development is to be shown, mobile pictures are helpful.

Magnetic board

In its simplest form, the magnetic board is a sheet of metal which has been mounted on a sheet of wood such as plywood or hardboard, framed so that the sharp edges of the metal are covered. The metal itself is not in fact magnetic but it must be of the kind that attracts magnetic materials e.g. mild steel Tinsplate or Zinc. Magnetic materials used with these boards include metal disc magnets, plastic strips, glue magnets and magnetic strings.

The magnetic board has a great advantage over the chalkboard; “cut-outs” are used on this board with the aid of a magnetic attachment. This enables the cut out to be moved about as often as possible and more cut out can be added or taken away as the need be.

Usefulness

- 1 It is particularly useful for showing the effect or moving shapes to different positions.
- 2 The stages in the cycle of movement of a mechanism.
- 3 Traffic problems
- 4 Work studies and economic problems.
- 5 They are really better employed where sustained observation of a series of maneuvers is necessary. These can be taught visually, step by step as each incident can be made to follow one another more quickly or slowly as desired.

Advantages

- a) It is easy to put a material in position on the board and to move it around or replace it with a new material.
- b) Materials stay securely in position.
- c) The board can be used in conjunction with specially designed materials such as backdrops and cut-outs to make a lesson meaningful.
- d) It is adaptable to a variety of teaching situation
- e) It is able to carry heavy materials as compared to the flannel board.
- f) It stands out well to outdoor work
- g) The preparation of cut-outs is simple, once made they can be stored and reused many times.
- h) It can be used to fix charts and posters or pictures easily in position

Disadvantages

It is expensive and very elaborate as compared with the flannel board.

Terminologies worth taking note of

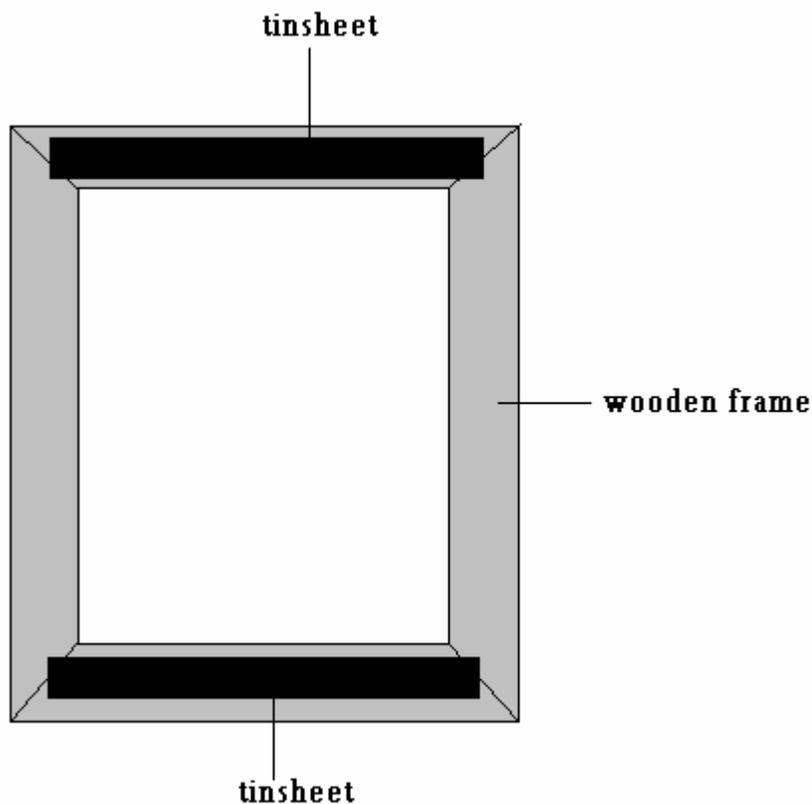
Backdrop

This is a large thin sheet of white paper, which is attached to the magnetic board by placing a magnetic counter in each corner. On this paper is a pre- drawn simple piece of

scenery on a practical level. Backdrops provide a uniform colour for the magnetic board. It ensures that the cut-outs stand out against the white background and also white edges of the cut outs will not show up.

Cut – outs

A term used to describe different kinds of visual materials, which are superimposed on the backdrops. Putting a magnet on the cut-out keeps a cut – out in place on the board or a magnetic strip can be placed on the reverse side of the cut out to make cut-out hold securely in place. Since teachers must be innovative, you can use the side or back of a steel cabinet in the classroom as a magnetic board. In another form, you can cut two strips of steel sheet and fix these on strips of wood and which can be used to hold your charts in position.



AN ALTERNATIVE – Steel cabinets.

NOTE; A more powerful magnet can be placed behind the board which will make cut – outs move without the teacher necessarily standing in front of the board.

Flannel board / Felt board

These adhesive boards work on the idea that rough surfaces when pressed against each other will stick together.

Construction

Cut wood (plywood) to the required dimension; cover one side with the flannel or felt, stretching it as it is pined with drawing pins.

Substitution

An old blanket, singlet, jute sack, pull – over, (material for knitting)

Cut – outs

This can be got from magazines or drawings. Numbers can be got from old large calendars by backing these materials with flannel, glass paper, ink blotters, sponges or sack material. These adhere readily to flannel or felt.

Using the flannel

For a more effective use of the flannel board the following suggestions are worth noting

1. Plan and rehearse your flannel board presentation. Decide where each picture should be placed and when.
2. Keep your presentation simple. Do not cluster up the board with too many materials that are not essential for the understanding of the lesson.
3. Make sure that the board is securely placed where every body can see it.
4. Always draw the attention of the student to flannel board presentation but not to yourself. Stand on one side so as not to block the view of some students.

5. Before starting the presentation arranges all materials exactly in the order you want them to be and place them within easy reach.
6. When placing materials on the board, a downward stroke accompanied by firm pressure from the hand will result in better adhesion
7. It may be advisable to tilt the board slightly backwards. This also helps the adhesion of the material.
8. Test the backing of each material to make sure that they stick to board. There is nothing more embarrassing than having to pick up your material all over the floor in the middle of your presentation. Students have their own sense of humor. It is more likely that they will laugh at your misfortune rather than sympathize.
9. Remember that the materials can be easily blown by the wind coming from the door, window or electric fan. Be sure, therefore, to place your board away from any possible source of sudden strong wind

POSTERS.

People often mistaken posters for charts. This is because they have similarities, but in actual fact they are two different pin ups.

The audience for charts is students and that of posters are: a. Stayers' still e.g. bus stops b. Passer bys

Posters must be captivating. There will be no one around to add voice to draw attention. This must be put into the poster itself. This means there will be no teacher in place or no explainer.

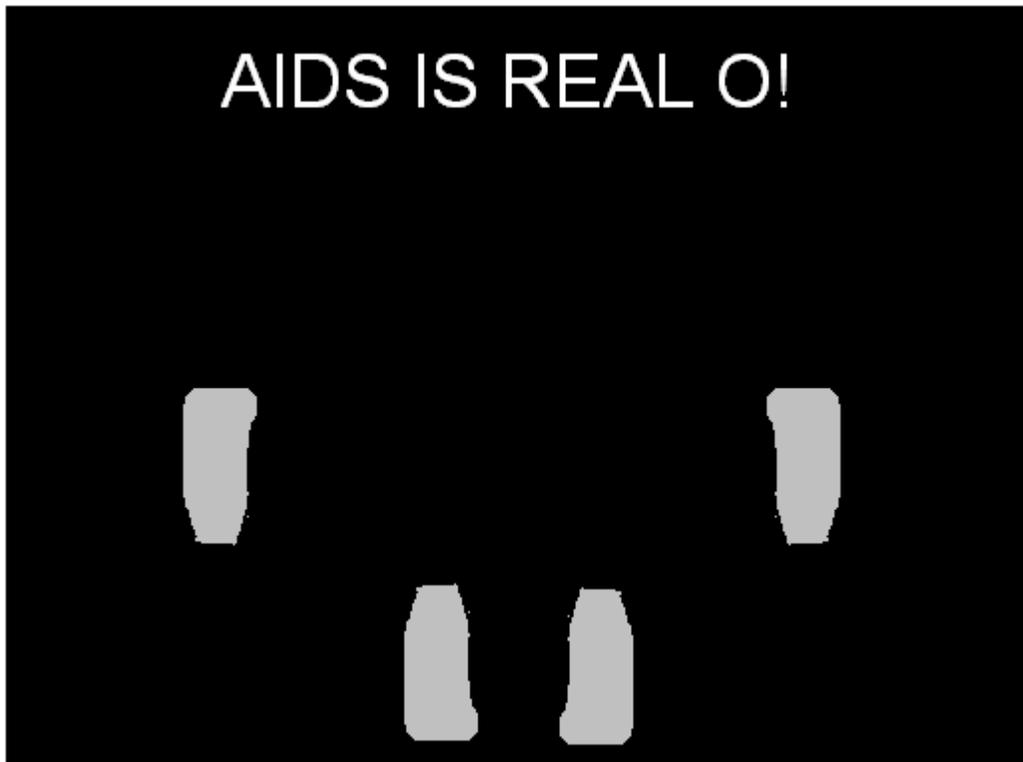
Power in posters.

1. Should be vary hold
2. It should be very simple image, words because someone busy going to work cannot read sentences.

3. Should be very attractive, attractiveness depends mainly on colour it has power to attract.
4. Should be self-interpretable.

Purpose

1. To warn
2. Invite
3. Advertise



CHAPTER SIX

PROJECTED STILL PICTURES

These are motionless pictures that are transferred by the help of light, onto a screen. All projection equipment's require some sort of power for operation.

Slide projector

Fred A Teague (1989) defines slides as small positive films mounted in a study frame. The slide projector is the device used to transfer the information on the slide to the screen. Picture Mounting frames are typically white cardboard that comes in several sizes. The 50mm x 50mm slide is the most common type, for instructional purpose.

Types of slide projection systems

The three types of slide projector are

1. slide projector
 2. sound slide programmes
 3. multi image presentation
1. Slide projector only

A set of slides is arranged in the carousel tray of the slide projector to suit the lecture, so that the lecturer starts lecturing whilst projector transfers the information in line with how he talks.

2. Sound slides programs.

This type of slides is operated with an audio recorder. A cable is connected from the special sync (synchronizer) tape recorder to the slide projector. This helps in

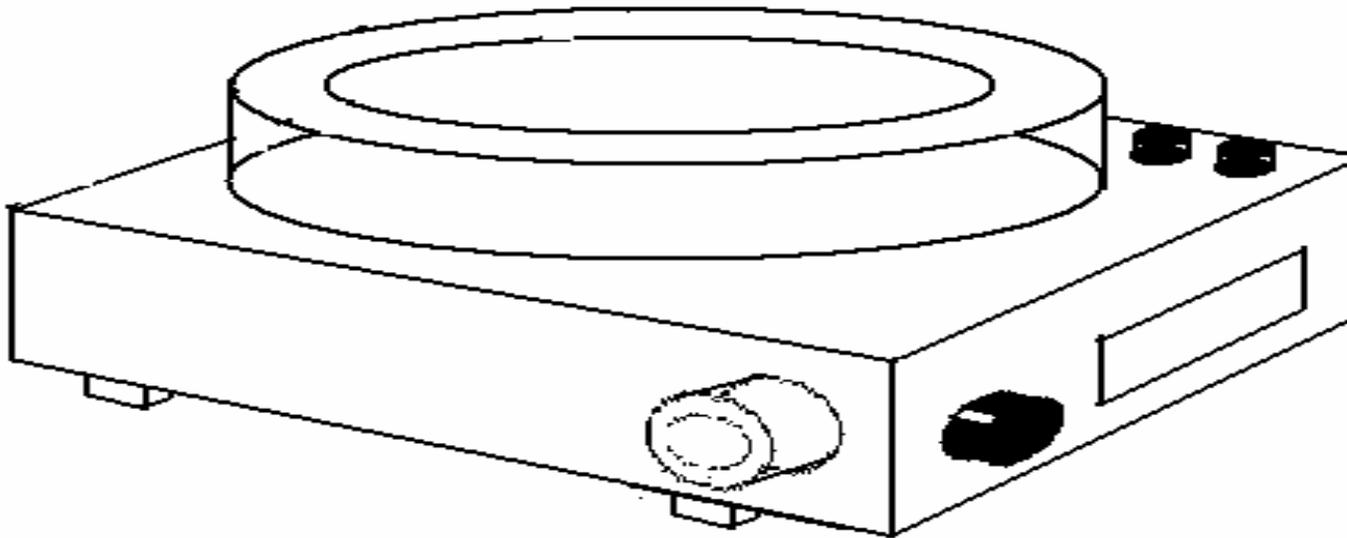
listening and viewing programs at the same time. The teacher is virtually free here until the slide show is over.

3. Multi image presentation.

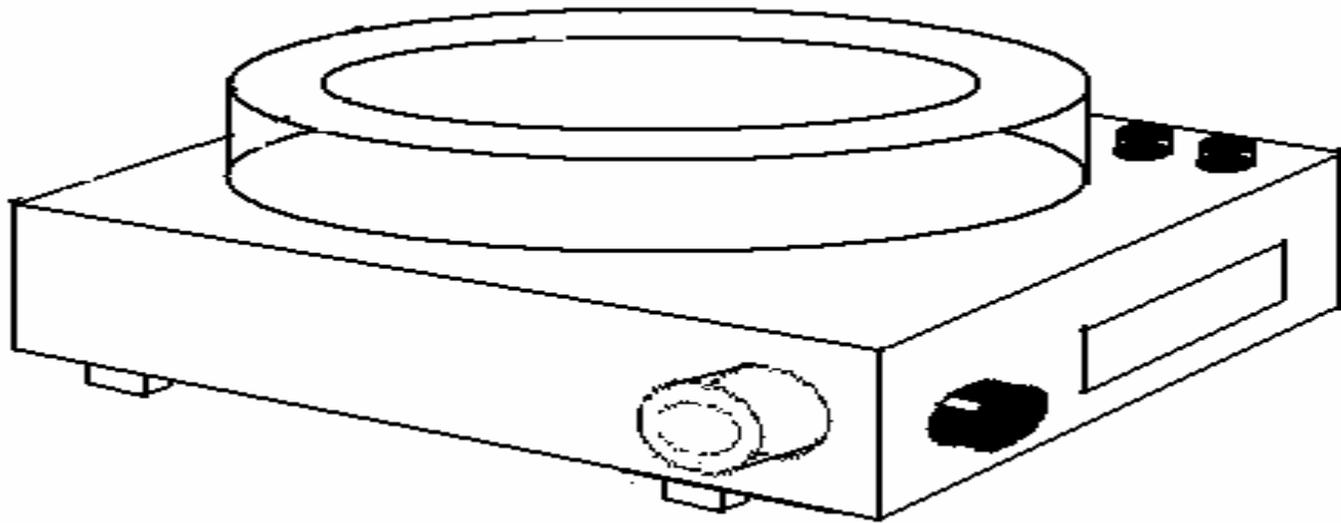
This also uses an audio recorder, but the difference is that this can project two or more images onto a screen at the same time.

Advantages of using the slide projector

1. The slide projector brings out a vivid image on a screen, which portrays realism.
2. This is a good media for individual learning since slides can be synchronized with sound.
3. In using slides, it can be arranged according to how one wants it. Arrangement can equally be changed at any time to suit the lectures.
4. Slides are easy to operate and can be stored conveniently.
- 5.



- 5) Slides are inexpensive; teachers and students can provide their own slides for programs.



Parts and functions

By courtesy of JE Kemp 1989

1. Slide Carrier/ Tray – it is the tray on which slides are arranged in a preferred order to enhance the position of slides in particular lesson.
2. Power Switch – it is the switch which puts the slide projector off/on
3. Timer – this is used to regulate the pace at which each slide could be shown
4. Select button – it is used to select a particular slide.
5. Auto focus switch enables a slide to be put in focus
6. Lens focusing Knob- this knob allows the user to adjust the lens.
7. Lens – the lens comes in a variety of focal lengths. The focal lengths of the lens in the distance from the lens element to the film surface.
8. Elevation button - this raises the slide projector upwards and downwards.

How to load slides into a tray

Fred A Teague (1989) in his book states the following process of loading slides into a carrier used tray as.

1. Place the tray or carrier in front of you with the slot number one at your right hand side.
2. Turn the retaining ring counter clockwise and remove it.
3. Look at the slide; turn it so that you read it properly.
4. Turn the slide upside down and drop it into the slot.
5. Follow the same procedure for each slide in series.
6. Replace retaining ring to ensure that slides do not fall out of the tray.

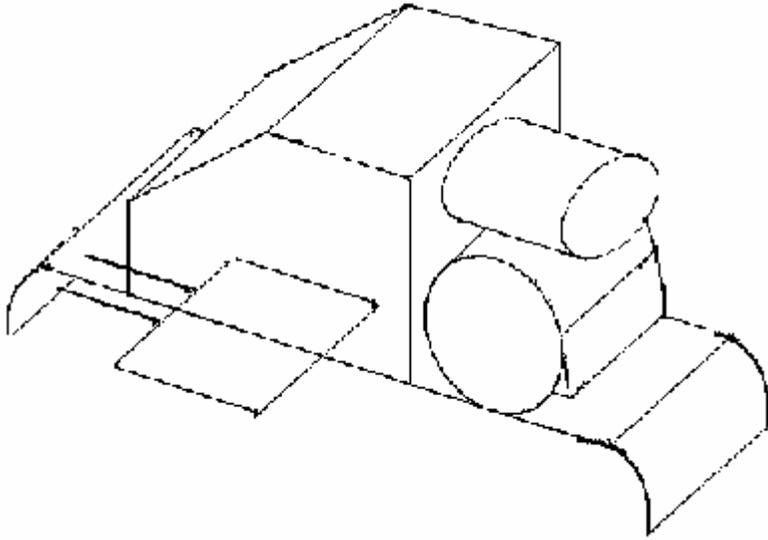
Care and maintenance

1. The slides will sometimes not feed properly in the projector due to bent or frayed slide mounts. When this happens, straighten or slightly trim the edges of the mounting frame.
2. When the slide jams in the projector making it difficult to proceed on, remove the tray using this method.
 - (a) Insert a screw driver in the screw slot
 - (b) Turn the screw slot counter clockwise and lift the tray from the projector
 - Do not cover vent holes. Make sure the fan is working before using the slide projector
 - Avoid dropping the slide projector.

Episcope

As stated by Longton Gould-Marks (1966), Episcope is a type of projector that can project any non-transparent or opaque object on to a screen. Such as

pictures, book illustration text, flat Specimens like coins piece of textiles. Some modern episcopes can project three-dimensional objects such as tools.



And is often referred to as an opaque projector. The principle is simple. The object to be projected is placed on a tray usually at the bottom of the projector. A powerful light is reflected onto a mirror and the image is reflected through a lens onto the screen.

Operating instructions

1. Connect grounded plug properly to power.
2. Usually on the left side, the operator should stand beside the projector allowing the light to shine over his /her right shoulder.
3. The object to be projected should be placed on the projector stage facing upward. Place it, in a way that it can be viewed or read while holding it in your palm
4. The projector is then turned on, sized and refocused on the screen. The head assembly is moved at the top of the projector either to raise or lower the image of the screen.

Advantages

1. It can project illustrations, photographs, maps, technical diagrams and almost every form of graphic material
2. It can give enlarged copy of diagrams which can be simplified, coloured or modified to meet your need
3. The projector has the ability to compel attention of the learners
4. The preparation of the materials is simple and its preview for the purpose of lesson preparation presents no difficulty.
5. It is good for large and small audience.
6. Its usage does not require any special training.

Disadvantages

The Episcopes has so many disadvantages and among those stated by Ralph Cable. (1979)

1. The range at which materials can be projected is restricted
2. Most episcopes are bulky and unwieldy and are thus not easily transportable.
3. The heat generated by the powerful lamp sometimes has a damage effect on flimsy material

4. Episcopes projection requires very good blackout.
5. Notes taking is difficult since the room is darkened during viewing

How to use the episcopes for effective teaching

1. Arrange the seats and prefaces the object to be projected so that amendments, alterations or modifications can be made before the learners are seated.
2. The projected time should be well scheduled so that materials will not be kept on the platform of the projector for a long time since this might have effect on the material due to excessive heat generated by the lamp.
3. The room must be totally dark since the light output of an Episcopes projector is relatively low, so that objects will be seen clearly by the learners.
4. The order of materials you intend to project must be pre-arranged

NOTE. Materials can be stacked in the preferred order and placed in the projector with the bottom of the visuals towards the screen. The visual changed by pulling each one off the top of the stack as the presentation is made

THE OVERHEAD TRANSPARENCY

An overhead transparency is an image on clear acetate or plastic, which has been prepared for use on an overhead projector.

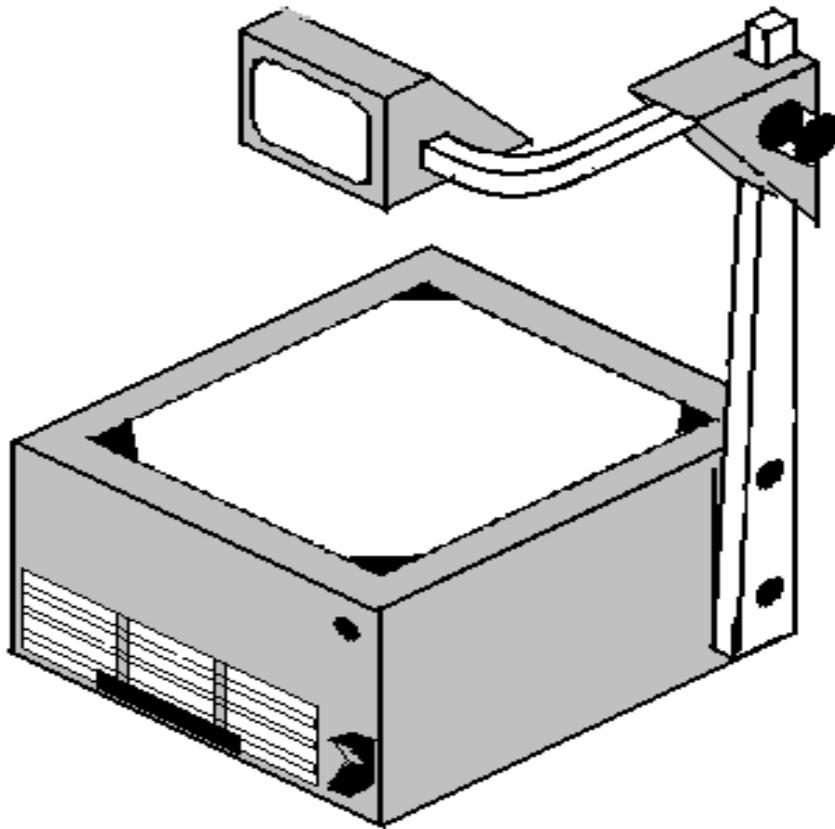
Overhead projector

The overhead projector is a device, which projects large transparencies from a horizontal table through a prism and a lens to form a brilliant image on to a screen behind teacher.

It is taught of as the modern equivalent of a chalkboard. Seymour (1937) and foster (1968) conclude that dark lettering displayed on a light-coloured board is more easily seen by students than the traditional white on a dark board.

Reasons for its increasing use

1. Lack of technical complexity
2. Has almost no maintenance problem, save occasional replacement of the lamp.
3. It is adaptable to different teaching styles;
4. It enables the teacher to face the class at all times of the lesson
5. A bright image can be projected in a lighted room, permitting the teacher and students to see each other
6. The transparencies can be stored and retrieved.
7. Information on the transparencies can be photocopied and distributed to individual students.
8. It is very clear to use as compared to the chalkboard.



What the overhead projector can do.

It can project;

- (I) Transparent material in black and white or colour.
- (II) Sequences of transparent overlays

- (III) Tracing of technical and architectural drawings
- (IV) Teacher's own handwriting and illustration at the time of teaching
- (V) Silhouettes, working models and certain kinds of scientific experiments

Parts and their functions

1. **ON/OFF SWITCH:** Used to switch the projector on or off.
2. **GLASS PLATEN:** It is the stage or working surface on which you place your transparency. The transparency is placed on it to enhance positions for the information
3. **PLASTIC FRESNEL LENS-** Its purpose is to spread out light rays from the lamp so that it will project an evenly illuminated image on the screen.
4. **LAMP:** the lamps provide the lens with light, which helps to transfer information onto the screen.
5. **FAN:** This helps to cool the lamp.
6. **FOCUS ADJUSTMENT KNOB:** This knob allows the user to adjust the head lens.
7. **HEAD LENS:** This directs the light path from the lamp through the fresnel lens to screen.
8. **PARAPOLIC REFLECTOR:** The reflector arrests all rays from the lamp to do meaningful work. The overhead projector has three main controls.
9. The head with the projection lens tilts to raise or lower the projector image on the screen.
10. Moving the complete projection head up or down using the focus adjustment knob focuses the image. In some models the focus knob is on the light box and the entire column moves.
11. The on/of switch in later models has two brightness positions or sometimes there are two switches. Using the lower light setting prolongs bulb life considerably.

How to set up OHP.

The overhead projector is, as its name implies, “over the head” ... of the speaker or lecturer facing and maintaining eye contact with the class.

Golden rules

1. The audience should have a clear uninterrupted view of the screen. This will probably mean that the screen should be raised and if necessary positioned across the corner of the room to give a clearer view to more people. The lecturer should be able to work the controls easily.
2. The OHP can be used without blackout but it is best to position the screen to avoid direct light from a window falling onto the screen. A partly drawn curtain helps
3. The screen should be tilted forward at the top to avoid distortion (key stoning) Key stoning not only effects the overall shape of the image but all vertical lines on the transparency are affected also. Just imagine what it does to parallel lines.
4. The stage and the lens underneath it must be kept free of dust. The instruction book will tell you how to remove the large under stage fresnel lens for cleaning. Dust it with a soft brush or wash in warm soapy water. Replace it with the correct side uppermost
5. Make sure the projector is firmly placed on a low table or trolley
6. Avoid touching the quartz iodine lamp with your bare fingers. If you should by accident touch the lamp with your fingers, use a rubbing alcohol to clean off all prints before putting the lamp on. And remove the OHP only when cool.

Tools for writing or drawing acetate

1. FELT MARKERS; there are permanent and non-permanent ink markers. The former creates bold and durable images.
2. INDIAN INK (Black); this creates the most solid line; it is an efficient colour for overhead projectors.

Type writing. Typewriters with bulletin or primary characters produce the best results.

3. Sharp pointed metal (scriber): can be used to draw or trace mechanical and architectural drawings or sketches on the acetate sheet .The cut lines project on the screen.
4. Stick – ons, opaque letters and symbols: These can be used to create contrasts, movements and silhouettes on transparencies.
5. Computer prints; Information on the computer can be printed directly onto the acetates or a hand-out can be photocopied onto the acetate

Using the overhead projector.

Now that the OHP is set up correctly it is ready for use. You can use it in a number of ways.

- Using prepared transparencies
- Writing with special OHP pens / attachments
- Using working models, solid silhouettes

Some useful suggestions

Use it to replace the chalkboard

Use it to summarize your lecture or to highlight key points

Use it to show diagrams or illustrations

Use the techniques of “Revelation “ and “overlay” which are peculiar to the OHP use.

Rules of good practice

Only switch it on when it is required – if you leave it on while you are talking about something else, it can distract your students’ attention. It also wastes energy. And can shorten the life span of the bulb. When pointing at a reference,

point to the transparency on the stage and not at the screen. Don't wave your pointer about. Keep it steady.

Always make sure a spare lamp is available and that you know how to change it quickly.

CHAPTER SEVEN

REAL OBJECTS

Definition

1. A real object is an actual, existing thing that can be seen or touched. (From Longman's Dictionary).
2. Real objects are 'creation' that exist, in fact, not imagined or supposed. They appear in their natural creation and are accepted in their original form.

Uses

Real objects are indispensable teaching aids, used during instructions. Since within their natural status, they do attract considerable interest and invite close attention especially if the object is fearless and harmless to sensory organs, learners openly get involved and learning process is made easier, which in turn makes teaching much easier for the teacher.

Generally, living objects are better visual aids than preserved ones or pictures of them. The care and attention, which children must exercise in catering for the living creatures, teaches them a great deal. In the selection process, care should be taken that those selected, as visual aids are big enough to be seen clearly by all the learners, else they are replaced with models or specimens

Even though, these real objects are good aids, some sometimes pose problems since they do not reflect real information (i.e. human body could not be operated upon for a mere reason of showing how the arteries perform their duties). But in case of other real objects such as a watermelon or pawpaw or even frogs etc, they could be cut and used as aids and some can serve as good dessert after the lesson. This factor, however, must be considered when using real objects:

Does the real object truly show the concept being taught or would some other form of media be better?

Types of real objects

There are two types of real objects:- They are :-

1. Natural real objects
2. Artificial real object

1. Natural real objects:- These are the real creation of the Almighty God. E.g. grasshopper, spider, goat, human being.

2.



2) Artificial objects:- These are man made objects. E.g. sewing machine, vehicles, and deep-freezers. Etc.

Materials / Design

Materials for artificial real objects include, wood, metal, plastic etc.

How real objects are used in teaching

- The real objects can be arranged in front of the class so that students can see it.
- If the items are so small or tiny but durable, it can be passed on among the students to observe.
- If the objects are too small to be seen, they can be enlarged on an opaque projector or microscope.
- Some real objects can be improved for instructions purpose by doing a cut-away. The item may be cut in half, exposing the internal make-up of the object.
- The real object can also be attached to a display board and the art labeled. Salient points, colour coding, labels and arrows may also be useful.
- Students could be put in groups to take their turns to examine the real object.
- Educational tours can also be organized for students to go and see real object, which are difficult to bring into the classroom.

Advantages of using real objects as instructional media

1. Real objects offer wide scope for more realistic approach.
2. Real objects meet the requirement or every subject.
3. Make understanding of teaching / learning process easier.
4. Appeal to senses other than sight and sound.
5. They can be obtained in their natural form, which are the best, or the universal model that can be used in teaching.
6. Real objects are labour saving devices.
7. They increase active participation of learning.

8. They present clear and unquestionable learning experiences.
9. Students are able to register, retain and retrieve information when real objects are used.
10. It saves time, which would have been used to explain things in abstract and reach more students in a very short time.
11. Teaching is made easier by the use of real objects.

Disadvantages

1. Some real objects are too heavy and cumbersome to carry and hold.
2. Some real objects can be dangerous, fearful and harmful to learners. E.g. a lion or a snake.
3. If dangerous real objects are used, teachers and learners alike feel reluctant to get actively involved in the lesson even though they might have been tamed.
4. Little creatures may turn to die as learners examine them and that destroys the objective of using the teaching aid.
5. The use of the real objects can be costly. E.g. Educational tours to places of concern such as machinery or production industries.

SPECIMEN

Teaching and learning using specimen does not only make teaching and learning very easy but it draws both students and teacher closer to nature. In this wise abstract journey of the mind to explore knowledge is brought closer, since the environs serve at the rich source of supply. A specimen is an object that is a representative of a class or group of similar objects. Again it can be the real object, which cannot exhibit the characteristics or the functions of the living thing; Examples are cheque booklets, electricity bills, machines and preserved creatures or vegetables.

In a nutshell specimen is the real or the closest alternative to the real thing. It is often more suitable for the instructional media than any other aid since they appear in their natural form; And also the attention and importance children attach to these enhances learning and make teaching very easy,

Specimen has done much in the classroom and has also found its way to the market places, departmental shops, banks, hospitals, homes etc. An author, after publishing a book will pick one to the shelf or to the market for the customers to examine. To distinguish it from the rest, sometimes, the word "SPECIMEN" is embraced on it.

Lecturers in medical sciences use this specimen to communicate between themselves and their students. This enhances academic skills. It also helps teachers to relate students to complex situation without referring to life objects. It also helps to eradicate those traits that tend to prevent the students' productivity.

Teacher teaching learners on cash deposits and withdrawals finds his work easy and simple if he makes available cheque counter cheque savings and withdrawal forms, Sika cards. Etc.

These items (specimens) provide ready and easy accessible information. In addition, if the government wants to introduce a new currency to its citizens, it first sends the specimen to all banks to exhibit or give more publicity people before releasing the money to the public. The same procedure applies to postal and money orders, stamps, invoices, receipts. Etc.

In fact specimens are very ideal and less expensive since the immediate neighborhood serves as a rich source of supply. It gives the students an immediate grasp of knowledge. To the teacher, specimens are labour-saving devices but also provide easy means of teaching since the schools,

organizations, churches and even bereaved homes/families have no difficulty in selecting and circulating selected clothing for their specific reasons. What is done is to pick samples of the selected material and it is passed round for each member to pass comment when finally accepted, it is this same piece, which is sent to the factory, or wherever it is to be purchased.

Advantage:

1. It helps the teacher to teach effectively
2. The teacher talks less.
3. It clears doubts in students' mind.
4. Helps students to have clear and easy understanding
5. Students can handle and manipulate the specimen.

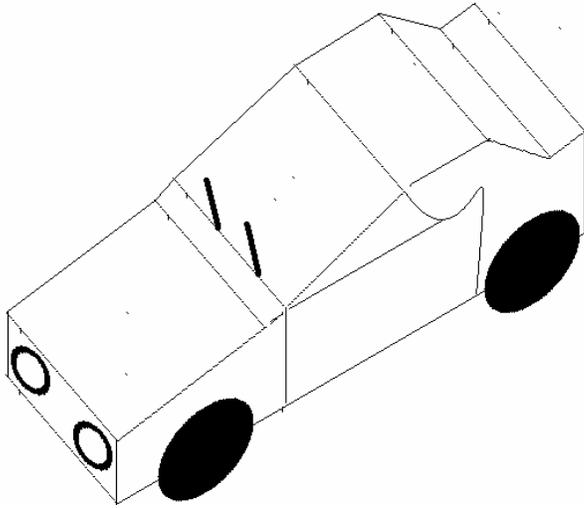
MODELS

A recognizable, three – dimensional representation of the real thing.

These are concrete objects, some considerably larger than the real objects.

They are mostly 3 – dimensional and sometimes sectional to explain clearly the cross-section or functions of the original. Working scale models – specific action of the original is duplicated and could be explained easily.

Models offer a kind of shortcut or substitute for the real thing sometimes they can be more effective than reality. Models should not be made of fragile materials.



Purpose of models in instruction

- a. Models simplify reality. As they are three – dimensional they evoke curiosity and interest.
- b. Models concretize abstract concepts. They simplify complex objects and accentuate important features with colour and texture.
- c. Models are of compact dimension. They enable us to reduce or enlarge objects to an observable size.

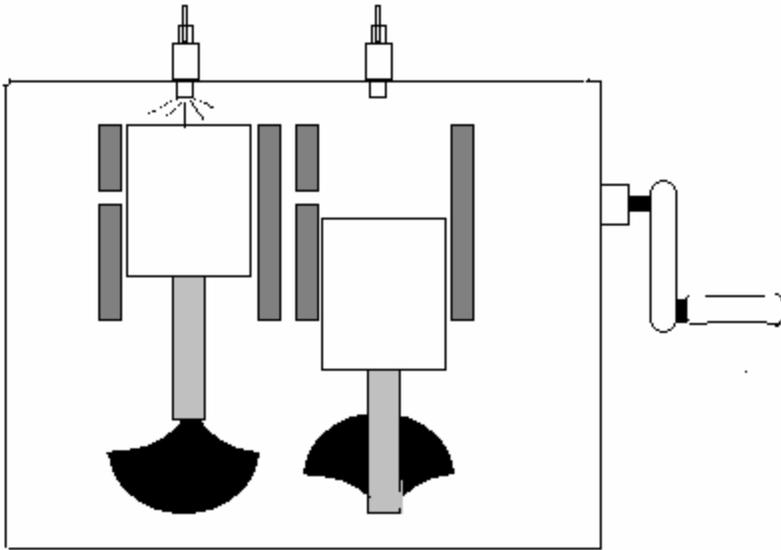
- d. Models give the correct concept. It may not be possible or practicable to make students see the whole of a large industrial unit or even a large machine unit.
- e. A large process could be easily demonstrated by a model as they provide interior views of objects and machines
- f. Preparation of models in itself could form a topic for project work. Simple paper or clay or plasticize models can be used for younger children. A working model will secure immediate attention and will serve as a motivation. The interest stimulated could be utilized to get the real thing or when the real thing will not be helpful to give a better explanation.

Materials for preparation of models

- 1. Cardboard
- 2. Plastic materials (clay, bee wax and plasticene)
- 3. Sand/glass paper
- 4. Plaster of Paris (Duplicate Copies of Objects)
- 5. Wood
- 6. Metal (sheets, rods, tubes, angles, wire etc.)
- 7. Acrylic (Perspex) and PVC

MOCK – UPS

This is 'an operating model, usually at full scale, designed to be worked with directly by the learner for specific training or analysis' – it is an imitation of the real thing. Some elements of the real thing may be purposely eliminated in order to focus attention on others. They are very useful in giving training in complex skills.



DIORAMAS

A diorama is a three – dimensional scene in depth incorporating a group of modeled objects and figures in a natural setting. This scene is set up on a small stage with a group of modeled objects kept on the foreground, which is blended into a painted realistic background. When colour is used in appropriate realism

When to use models

Models are used when;

1. The real thing is too large, bulky too small to be brought into the classroom (building or an atom)
2. The real thing is dangerous (snake, toxic waste)
3. The real thing is difficult to get or not available (rocket, magma or a volcano eruption)
4. The real thing is too delicate or fragile (wine glasses, an egg)
5. The real thing is very expensive (diamond)
6. The desired part of the real thing can not be shown (human heart)

Teaching methods to be adopted when using models / specimens.

One will need to ask the learners to gather around the model unless it is extremely large. Pre-arrange an area for this activity to avoid necessary confusion and distraction. An alternative is to aim a video camera at the object and see it enlarged on a monitor. If the model is a functioning one, you may want to allow the learners to handle and operate it. This creates high interest and permits a close-up observation of how it works. Also it encourages class participation.

After a formal presentation, it may be appropriate to leave the model on display for a period of time, allowing learners to independently study the item. It is necessary to take students on excursion to observe some of real objects, which cannot be brought to the classroom, e.g. harbours and airports.

Storage and protection of teaching aids

Since models, real objects and specimens are expensive and complicated, students must be assisted before putting them into profitable use. They must be protected immediately they are made. There is almost no limit to the forces, which try to destroy them; for instance, dust, wind, rain, termites, moth etc.

Models, specimens and real objects are to be kept in polythene sheets to prevent them coming into contact with any form of liquid. In case the air is damp when the bags are sealed you can put in some silica gel, which absorbs water from the air. When it has itself become damp, it can be put in the oven to dry off the moisture and can be used again. Termites, borers and other small creatures which damage papers, cloth and wood can be dealt with at best by using chemicals, which, when sprayed on to the visual aids give good protection. But care must be taken in their use since they are usually highly poisonous to humans.

Advantages of models

1. They draw students' attention to the subject or topic
2. They stimulate or motivate students' interest in a lesson
3. They provide opportunities for class participation in-groups or individual.
4. They make clear and understanding process and constrictions, which are not possible with two-dimensional aids.
5. The models appeal to senses more than sight and sound
6. The handling and construction of models in an essential part of learning process which help in registration and retention of learning task.
7. They can be used to replace real objects or specimen, which are not readily available
8. it is not costly as compared to the real object

Disadvantages

With models, learners are deprived of feeling the real texture, smell, sound etc. as compared to the real object. Models if not handled carefully cannot last.

DIRECT EXPERIENCES.

Field trips and Excursions.

Excursion may be defined as journey, ramble with the intent to return. The term is used when a person or group of persons undertake tour of places where they expect change from normal daily life. Such excursions are undertaken mostly for recreation and pleasure. For educational purposes the term in addition will include gaining additional knowledge, skill or attitude through direct experience. For this reason it is important that suitable places should be arranged for visits in all educational institutions. When excursions, are taken for the purpose of gaining or developing knowledge they could also be termed study-tours and field-trips.

Types of field trips

1. Local school trip
2. Community trips
3. Tour or journey
4. Inter-school visits
5. Individual trips

Organizing a field trip

The stages in the completion of a field trip are:

1. A felt need
2. Selecting a suitable place (teacher should know about the place)
3. Listing specific objectives of the trip
4. Planning the trip in minute details
5. Preparing students so that they derive maximum benefit from the field trip, that is, briefing them about all aspects of the trips, what to see and observe, safety measures to be observed etc.
6. Suitable conveyance, boarding and accommodation should be arranged well in advance.

7. The actual field trip and
8. Consolidation with follow-up activities. The teacher should involve the students in the planning of the field trip. Where a field trip is not planned well in advance, it ends up in confusion and a waste of time and money.

Students activity during field trips

1. Students should be aware of what to expect (suitable materials about the place should be at the disposal of students)
2. Students should take notes during the visit
3. Students should recognize machines, process, landmarks etc. about which they have been briefed.
4. it is essential that students move as a unified group obeying the leader (it may be necessary to break up in several group)
5. The visiting group should not act as a source of disturbance to normal activity at the location.
6. The students should also be aware of possible accidents that may occur and all precautions that should be taken to avoid the occurrence of any such accidents.
7. Sufficient time should be spent if real gain of knowledge is desired (no need to hurry)
8. Photographs and video converges should be taken only if permission is sort and granted.

Follow-up activity

When the party returns from the tour or field trip. Every student should be made to write an account of the excursion. Seminars, group discussions, quiz, programmes etc. can be organized during which the knowledge gained can be consolidated.

Other benefiting experiences

1. Study of the community
2. Exhibitions
3. Museums
4. Demonstrations.

CHAPTER EIGHT

GAMES IN TEACHING

Introduction

In order to promote and encourage habits in schools, some form of games could be introduced to revitalize the educational system and the instructional process in general. Learner's interest to participate in such games unwittingly stimulate them to learn through the playing of games. A new approach to support the tradition chalk talk and textbook method.

A game

A game is a context in which people or players agree to abide by a set of rules in an attempt to achieve a goal or objective. Harris (1979) indicates that games in an educational sense are set up to stimulate life. It provides stimulation in which problem-solving skills are used to win.

The advance learner's dictionary of Accurate English defines games as any form of play especially a contest in which there are rules e.g. football and cards.

World book Encyclopedia defines games as a mental or physical contest played according to rules. Games are usually played for fun, but this can also provide excitement and challenge. Many games also help develop mental, physical and social skills.

Reasons for designing educational games:

Some of the reasons for designing educational games are:

1. To help students to understand a particular subject or topic.
2. Prepare learners for what to expect in their next lesson.
3. Serve as research work and for self-teaching.
4. Solve difficult topics of a course.

Characteristics of games:

There are reasons for designing games and as such games must have certain characteristics.

1. A goal or objective to be achieved
2. Definite set of rules to be observed
3. Strategies for winning
4. Elements of competition and co-operation.
5. Visible results, which depends on chance and or techniques used.
6. Action and rewards (positive or negative)
7. Recreation and relaxation components.
8. Entertainment

Examples of games

1. Traditional games-aware Ampe, Alokoto etc.
2. Conventional games – Ludo, Cards, Snake and Ladders
3. New games – Akwaba, Monopoly, Wager fun, Agoro, Kwasasa etc.

SIMULATION IN EDUCATION

Simulation

Simulation means that one thing is much like another and that it reproduces the characteristics of something else in certain important respect, but otherwise different.

Oxford Advance Learners dictionary defines simulation as the deliberate taking of certain conditions that could exist in reality. E.g. in order to study them or learn from them; A computer simulation of golf swing.

Hours (1979) described simulation as a substitute system compared to a real one, which is often used in learning. This is because the system may be too dangerous or too complex or not immediately available.

A simulation game according to Herman (1975) is an activity that combines the characteristics of both games and simulation. It imitates some aspects of reality and thus it is enjoyable and educational - With emphasis on learning. This experience is the case in playing **KWASASA**, it is a game played by kids depicting the life styles and essential culture in Ghana. In the game the children can be asked to create a scene, recite a poem, drum and dance, perform a role-play etc.

All simulations are strictly governed by conditions, internal and external variables that may not be foreseeable. There are three types of simulation:

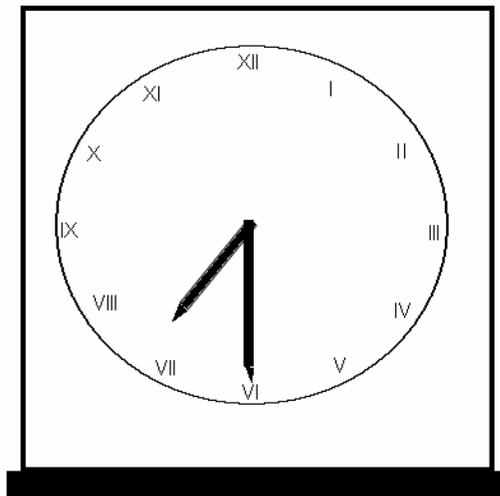
1. Mechanical computer simulation where equipment and machines are used as element and a situation in which man provides machines with decision-making parameters.

2. Man – machine simulation; where machine serves as a support for the decision.
3. Human simulation; which contains rules, roles and constraints of reference system (situation), possible choices, and where the operations, actions are the responsibility of the individuals.

Characteristics of simulation

1. Generation of environment otherwise impossible in homes, laboratories classrooms due to constraints of cost, danger, size, time practical realities etc.
2. Form of dynamic working model (always serving the intended purpose.
3. Represent behaviors that result from internal and external variables.
4. Represent stable behaviors.
5. Allows the exploration of role-plays in various situations.
6. Allow participants/players to manipulate time.
- 7.

The time clock game



This is a simulation game that can be played by two to four people at the same time and a judge who determines the results score marks for the players.

Items needed for the game

1. The clock board (with an hour and minute hand)
2. Hour dice
3. Minute dice

Rules of the game

1. Number of rounds to be determined by the team
2. One chance is allowed to set the clock
3. Correct response scores a point
4. A wrongly time set scores a zero
5. The judge announces the scores and positions won by each group of students or players

Procedure

1. Each player throws the two dice.
2. Transfers the values on the two dice to read on the clock (i.e. hour dice number to set hour arm and minutes dice number to set minutes arm).
After which the player tells the time.

Advantages of games and simulation

1. It encourages abstract thinking of children and keeps them busy.
2. Children readily want to participate in games and simulation exercises and so require no urging, prompting or outside stimulation from the teacher.
3. Facts, which are memorized and usually forgotten when not applied, become meaningful and remembered when used in enjoyable, realistic situations.
4. Greater learner interests are generated than would ordinarily or normally occur in other learning modes.

5. It promotes self-learning as it enriches learner's imagination and expands his / her experiences.
6. Students are more likely to experiment with ideas that they do undertake in.
7. Immediacy of feedback and valuable reinforcement encourage the participants' games and simulation sessions.
8. Games and simulations enhance interaction and improves on learning.
9. Self –motivation is encouraged on the part of learners as they can reap the benefits of their self interaction
10. Games and simulations, which contain high interest and low vocabulary content, will be effective for slow learners.
11. Games and simulations may increase the confidence of young people to deal with real world problems that seem impossibly remote from their lives.
12. Games and simulations are desirable supplements to any educational programme. They make abstract materials in a textbook vivid.
13. In games and simulations, gentleness and friendliness will enhance learning settings in school and homes.

Limitations of games and simulations

1. Games and simulations are time consuming and painstaking in design and evaluation.
2. Games and simulations are no solutions to educational problems. They may only be able to achieve some educational objectives, which the textbooks and teachers might not easily achieve.
3. There are the temptations of stealing and pilfering where real objects (money/materials) are used.
4. At times there is the possibility of teaching the wrong values to pupils.

5. In business simulations, the cost, number and qualities of articles and materials must be within controllable limits to avoid possible losses or damages where real objects are used.
6. In games and simulations certain norms and conventions are contravened. The participants may invariably introduce disrespect, shouts, insults and behaviors not ordinarily condoned.
7. It may promote child truancy if not properly controlled where children's interest could make them stay out from other duties.

ROLE PLAY IN EDUCATION

Role-play in the form of docu-drama is a technique in teaching and learning that requires some of the students to act the roles of other characters in a given situation. An example is Mock Parliament. The situation that should be realistic and not too complex may be described verbally or in writing to the students or the class. It is an informal dramatization, which deals with societal problems and issues.

Role-play is also a partial simulation of reality which is not based on processes per se but which is centered on play-acting. From the World Book Encyclopedia, Role-play is a method of teaching and learning. A real-life problem, such as a disagreement between two people, is described. Members of a group acts out roles. Each member tries a different way of behaving in the situation. Other members of the group discuss what happened and often suggests other ways of handling the problems. Role-playing helps people to understand the feeling of others. It also allows peoples to test new solutions to problems.

Effectiveness of role-play in teaching;

Role-play is used as teaching methods to appeal to the unique sense of the learner and facilitate the acquisition of information, learning material, attitudinal change or skills to be learnt. Through active involvement of the learners, information/ skills and knowledge acquisition is guaranteed to be possible. Role-play can be used in test students' mastery of the principle in everyday life of money exchange transactions.

Activity 1

- A. The seller
- B. The buyer
- A. Display a number of different items at different prices (tagged)
- B. Goes to buy different items at different prices
- B. Paid an amount more than the cost of items purchased for a change
 - A. To add the total costs of items purchased and subtract it from the amount
 - B. paid to give a change
- B To also do some addition and subtraction of find out the correct change to given him.

If both A & B have been able to perform with success it assures mastery of the lesson real life situation.

Activity 2

Role-play can be used to teach students how they can save cost in using the telephone. Select two students to play the roles of a caller and a receiver respectively.

- Caller dials number
- Receiver; "Hello "
- Caller; Hallow good morning..."

Here the teacher comes in to teach the pupils the correct way to receive calls. The receiver should respond to save the caller from paying a high bill.

The right way should be

Caller; Dial a number say 50331

Receive; “50331 UnEW can I help you?”

This readily informs the caller that he is in the right line and so he begins his message straight away by avoiding the next hello and any unnecessary enquiry that will cost him/her.

Activity 3

Safety as a role-play. The effect of not observing safety rules in the workshops, laboratories etc. can be as a role-play for students to understand the situation and how it would be like in real situation. Safety, World book encyclopedia, is freedom from harm or the danger or the precaution people take to prevent accidents. Accidents rank as leading causes of death through out the world.

Select 3 students to play the roles of craftsmen. Workers A, B, and C.

A - Working at a height

B and C working beneath A

B wears helmet

C does not wear helmet

A accidentally drops some tools (foam made) and it knocks B and C on the head.

C got hurt because he did not observe the safety rule of wearing a helmet.

Characteristics of role play

Characteristics of role-play include the following

1. Involves two or more actors
2. Requires social or psychological rules written or implied.

3. Provides specifications of roles and activities
4. Scenario develops through the actions/ behaviors of actors.
5. Actors constantly interpret one another's roles and action.
6. Include briefing and debriefing sessions

Some essential points to note

- Each participant tends to study, carefully, the information he or she has been assigned.
- All participants may be required to come together at one place and act their individual roles in an attempt to achieve the stated objectives
- A considerable level of maturity is required of the participants

The teacher has the responsibility to prepare, monitor and evaluate the exercise, even if it is open-ended.

Advantages

- 1 It promotes interest and there-by learning.
- 2 It affords the students the opportunity to play individual roles
- 3 It facilitates a development of inter-personal skills.
- 4 It enables the students to understand other peoples opinions or views
- 5 Simulation provides experiences in situation of supposedly high cost environment
- 6 Simulation can produce significant gains in communicative skills, persuasion and influence resisting techniques to suffer the consequences of reality.

Disadvantages

- 1 It requires a long period of time.
- 2 Students may lose sight of the learning point when they become engrossed in their roles.
- 3 It is only suitable for a small group of people
- 4 It is not easy for a teacher to apparently allocate roles to students.

CHAPTER NINE

REPROGRAPHICS

Introduction

One of the cheapest and most effective learning aids is the well-prepared duplicated sheet of paper. Handouts of various kinds can save a great deal of time for the instructor and the learner. Some examples are: lecture notes; summaries (these are specially useful when they correspond to the chalkboard or felt board summaries, laboratory worksheets; diagrams, formulae, problems, tests).

A wide range of methods and machines has now been developed to enable instructor to prepare duplicated copies of diagrams from books for class use. The subject is highly technical and has been given the name reprography.

Reprography

The use of the modern office copying machine and the duplicator as tools for producing one or a modest run of reproductions of documents of the same size as the original.

Reprographic equipment and their service

These equipments are the stencil duplicator (Gestetner), spirit duplicator typewriter, computer printers, teleprinter, photocopier, and facsimile transmission. Reprographic equipment enables us to choose or prepare a diagram, graph, table, piece of typescript, etc. and run off on a paper print for the

bulletin board, transparency for the overhead projector or several copies to be given to students

Duplicating process and copying devices

Copying and duplicating processes: A copier is generally accepted to mean a machine into which the original document and sensitive material is fed (by hand) each time a copy is required. On the other hand, a duplicator contains a master or stencil, or other form of printing plate brought repeatedly into contact with sheets of ordinary paper automatically fed into the machine.

Forms of reproduction

The four principal forms of reproducing multiple copies of various printed, typed, hand-lettered, or hand-drawn items for the classroom are: stencil duplicating, spirit duplicating, photocopying and printing.

DUPLICATING PROCESS

Stencil Process (Mimeographing)

The most common kinds of duplicator are that using a stencil of fibrous coated tissues, which is impervious to ink. When the surface is cut with a typewriter or with a stylus, the ink can penetrate, there by producing a copy when absorbent paper is brought into contact with it. The machine simply mechanises, the process of printing off. The stencil is attached to a roller, inked and pressed on to sheets of paper to give multiple copies. The stencil process is suitable for written or types or drawn materials in one colour and can produce up to 5000 copies or more depending on the quality of the stencil and the extent of cutting it has received. This type is mostly used for duplicating test paper, examination paper, circulars, notices, the school magazines etc.

Advantage of stencil duplicating.

- copy paper is cheap
- correction of the master is easy
- stencil duplicators are easy to operate
- A large number of copies can be produced from a stencil
- The master can be stored and re-used in future

Disadvantages

- It is difficult to print colour as separate stencils and duplicators will be used for different colour
- The quality of the paper is inferior
- It is difficult to correct the stencil, once used.
- It is messy

Spirit Duplicating (Hectographing)

This is the well-known process employing aniline-dye carbon papers and a wood-and-grain alcohol fluid to produce masters from which up to 300 or so satisfactory transfer copies can be made. Various colors can be used which is a great advantage of this process.

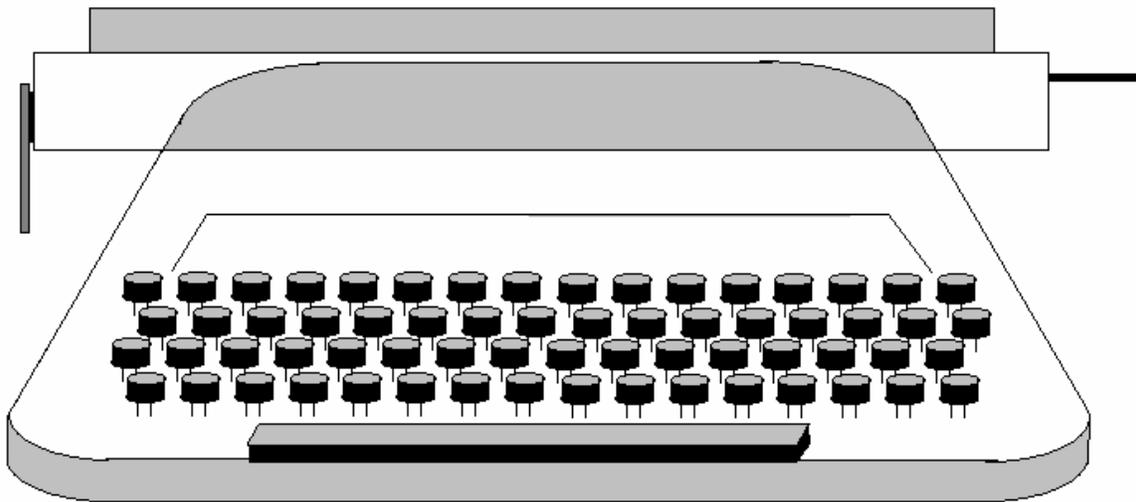
COPYING DEVICES

Copy devices can be classified in terms of uses, application as well as function of operation. There are different types of copying devices. The common ones listed below:

- Typewriters

- Computers
- Teleprinter (i.e. telex)
- Facsimile transmission (fax)

THE TYPEWRITER



The typewriter is the commonest office machine. It can be manually or electrically operated and is available in portable standard or modified styles. All the modification on the typewriter is made on the electric models. Most models of modern typewriters have several devices, which are intended to assist the typist to produce good and neat copy with minimum effort.

The few devices are:

- Card holding device; this allows a fairly stiff card to be front-fed into the typewriter, held firmly in position whilst typing is being done.

- Front feeding device: this device enables papers to be front-fed into the typewriter while another is fed in the conventional method and held in the machine.
- Golf-balls (simple elements) there are typing elements with different type faces, which are commonly used with IBM and some other models of typewriters.

Type wheel,

- Carbon ribbon: These are plastic ribbons with substances that give a black impression, very much like a new carbon paper and many other devices.

In addition there are different models of typewriters.

These are

- The standard typewriter
- The portable
- The dual-unit type
- The electronic type
- Memory type
- Magnetic tape type
- Magnetic card type and others

In actual fact the electric typewriter is the latest model of typewriter and has been adapted to many uses. The carriage and the keyboard are power driven but the typist needs to slightly depress the keys in order to operate the machine

Advantages

- Electric typewriters reduce the secretary's physical exertion of energy
- And allow for faster typing
- It produces neat and portable jobs
- It can make as many as twenty carbon copies at a time
- Documents typed on electric typewriters have better impressions.

The main disadvantage of the electric typewriter is its initial cost

- Retards office work in case of power failure

COMPUTERS. This will be treated in chapter eleven.

TELEX

Telex is a process by which messages can be sent using a teleprinter to other telex subscribers at home and overseas. Messages, which can be in code are typed into the teleprinter keyboard, like a typewriter and transmitted to the receiving machine. The receiving terminal can be left unattended and will record messages at any time of the day or night. Charges for calls are based on the distance between telex subscribers and the length of time it takes to transmit the message.

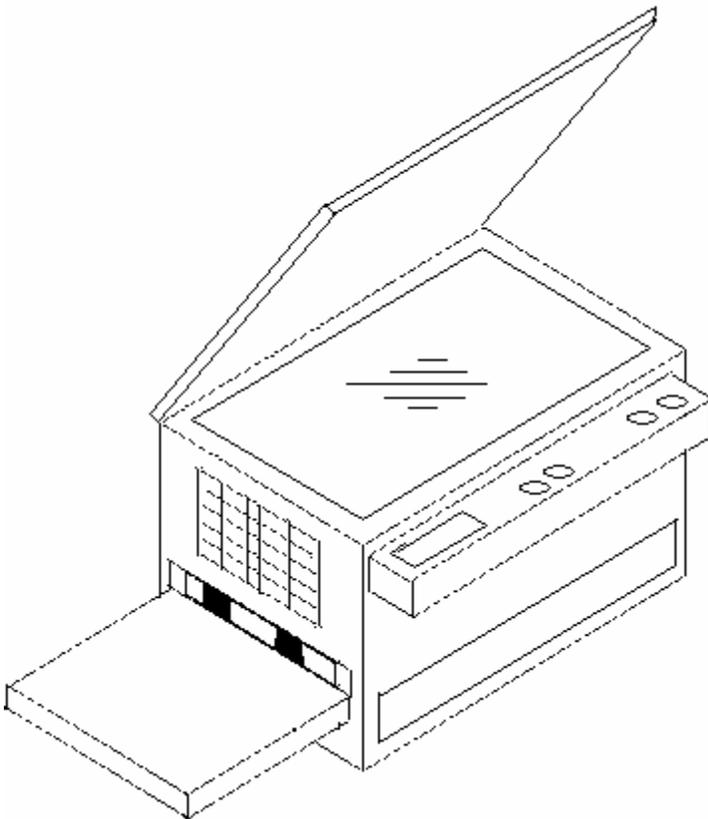
Facsimile transmission

Facsimile machines are desktop machines, which are similar to photocopies in that they make an exact black and white copy of an original. However, fax machines allow the user to send a document along telephone lines to another fax machine anywhere in the world. Facsimile transmission is simple to use. A document is fed into the transmission machine, the recipient's fax number is dialed and once the connection is made the document can be sent.

Fax machines have memory dialing and automatic redial functions to save the operator time. Firms with faxing equipment display a fax number on their letters or advertising literature and this number is used in making the connection between machines.

PHOTOCOPY MACHINES

One of the most common processes for producing material or handout is the photocopy. Cost of operating and owning photocopy machines is now more acceptable with institutions. Their good quality copies speed of operation and versatility have made them a very popular technique for duplications



Many brands of photocopy machines are now available in numerous size and styles with a variety of capabilities. Photocopy machines range in abilities from producing basic block image copy work to the more sophisticated systems that produce full colour reproductions on one or both sides of a sheet, they also have the ability to enlarge, reduce collate and staple the final product.

Several photocopier machines use regular bond paper, which is electrostatically charged by the machine as it scans the image from an original, which has been placed on the glass copying face

The electrically charged sheet of paper then receives a final layer of black powder called “toner” which contains carbon. The toner, which is heated permanently, adheres to the paper.

OPERATION: The most common types available here are Canon and Gestetner

In operating the Canon type, the first thing to do is to turn on the machine a few minutes prior to use, so that it may warm up. This usually takes about five minutes to warm properly.

- Ensure proper paper position to ensure proper paper production.
- Check the glass surface to see that it is cleaned with glass cleaner and soft cloth

- The operator should place an original document face down on the glass surface, using the appropriate guide marks; determine what type of copying needs to be done.
- Start with the machine image set for normal reproduction. Set the machine to make one copy and press the “copy” or “start” button to make a test copy and adjust where necessary.
- Set the machine for the number of copies.

CHAPTER TEN

THE VIDEO CAMERA

The camera is a device used to capture a scene in picture or visual form. The video camera, on the other hand, captures motion of events. And that means that it records sound and moving pictures to enhance understanding of what is shown. The camcorder is simply a camera and recorder all built into one unit. It implies that you can record and plays back immediately after the shots have been taken. Camcorders are in general, much lighter than the combined weight of camera and a recorder. Therefore it can be carried about with ease and operated by one person.

The controls and functions of the camcorder are:

1. Built-in microphone – for recording sound onto the tape.
2. White balance sensor window – for regulating colour quality
3. Tally lamp – inform the people in front of the movie camera that shooting is under way.
4. Light shoe – this holds the auto light and other accessories in position.
5. Operating switch – this is used to turn the camera on and off.
6. Camera/VTR selection cover slide – slides between the camera function and the video recorder function.
7. Zoom buttons – these buttons are used to zoom in or out.
8. Lens cap – for protecting the lens
9. Manual/auto focusing mode – a toggle switch that causes you to either use manual or automatic functions of the camera
10. Focus ring – after using the manual focusing mode with the focus button, adjust the focus to the desired subject by turning the ring
11. View finder – the subject in front of the camera can be seen through the view finder

12. Eye piece corrector – adjust the eye piece corrector to your eye sight so that the picture and the indicators in the view finder become clear and sharp
13. Tape eject button – to insert or take out a cassette, press this button
14. Battery pack eject lever – slide this lever to eject the power pack
15. Cassette compartment – insert a video cassette into this compartment
16. Start/stop button – press this button to start or stop shooting a scene
17. Grip belt – use to hold the palm firmly against the start/stop button

Standard accessories

The camcorder has some standard accessories that come with it. These are:

1. AC adapter – this is for supplying power to the camera or for charging the battery pack
2. DC input cable – connect this to the AC adapter so the camera works with direct current voltage
3. Battery pack or power pack – for supplying DC power to the camera
4. Shoulder strap – for protecting the camera from falling and to help you go around with camera with ease
5. AV output cable connect this to a television set
6. Auto light – to increase illumination for quality pictures
7. Battery packs charging connector – to connect power pack to adapter for charging.

There is a caution to be observed. It is recommended that you use the recommended accessories to reduce the risk of fire or shock hazard and annoying interferences.

There are also some indications in the camera that you should take note of since they enhance your performance greatly.

Indications in the View Finder

1. auto light mode indications

- AUTO: the attached auto light will turn on depending on the surrounding light condition
 - ON: The attached auto light is turned on
2. Manual white balance indications/
 3. Date indication – the year, month and day are displayed.
 4. Remaining battery power/index indication E – F. The indications begin to disappear from right to left as the power of the battery pack is being used up.
 - INDEX: This indication flashes when a recording is started and it indicates that an index signal is being recorded.
 5. Tape counter – To be able to play back a certain scene out at a later time, press the memory display button at the beginning of that scene.
 6. Warning/alarm indication:
 - The following indications are displayed to inform about the conditions of the moving camera.
 7. Shooting mode indications:
 - “REC” During shooting
 - “PAUSE” During shooting.
 - “CHK” During record review.

Shooting with the camera

1. Attach the charged battery pack
2. Turn the movie camera on.
3. Slide to “CAMERA”.
4. Insert a cassette with intact erasure prevention tab.
 - A few seconds after closing the cassette compartment, the movie camera will be in the shooting pause mode.
5. Remove lens cap.
6. Press the start/stop button.
 - To pause the shooting, press the start/stop button
 - To shoot the scene, press the start/stop button.

- To stop the shooting, press the start/stop button to pause the shooting and then turn the movie camera off.

NOTE: If the camera is left in the shooting pause mode for more than six minutes, the shooting pause mode will be cancelled and the view finder will be turned off (recording lock mode). To resume shooting from this condition, turn the movie camera on again. (In other cameras the camera will turn to the stand-by mode. In this case, you need to press the stand-by knob again). If the camera is left in the recording locked mode for more than 48 hours, it automatically switches off completely.

Preserve the life of the battery by charging the battery pack for at least three hours before and after use.

Holding the camera for shooting.

(a) Normal shooting:

- . When walking while shooting, keep both eyes open so that you can see where you are going and what is happening around you.
- . Place the movie camera on your right shoulder and hold it firmly with both hands. Put the shoulder strap over your head to protect camera from falling off in case someone bumps into you.
- . Hold the eyecup of the viewfinder as close as possible to your right or left eye to see the details of whatever you are shooting.
- . Take a firm stance with the legs slightly apart.
- . For stable images, it is recommended to use a tripod (optional) whenever possible.

(b) Low – angle shooting:

- . Adjust the angle of the viewfinder according to the position in which the movie camera is held.

- . If the movie camera is not held firmly in a stable position, the picture in the viewfinder cannot be watched properly.
- . For easier low-angle shooting, the start/stop button on the front of the movie camera can be used.

(c) Shooting from a high position:

- . Raise the eyecup of the viewfinder to get a good look at the picture in the viewfinder. You may enlarge the picture in the viewfinder to be able to see properly.
- . Always make sure you look through the viewfinder for better shots
- . Shoot with both arms stretched as much as possible.
- . You may take position on a higher ground for a much better shot.
- . Make sure your hand is in the hand grip.

(d) For more stable pictures:

Stabilize the movie camera by resting your elbows on a table or another stable, horizontal surface.

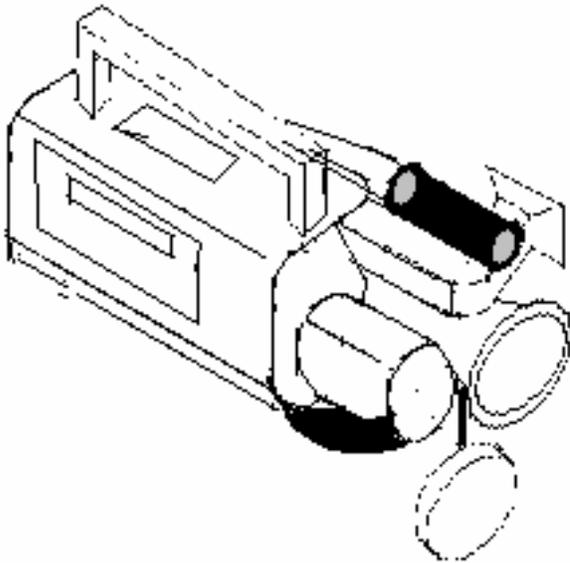
Playing back a recorded tape.

1. Make sure the VCR and TV are in good condition.
2. Before playing back a recorded tape to your class, make sure it is appropriate for the students who are going to see it.
3. Make sure you know the contents as thoroughly as you know any subject matter you teach. Also pre-view to check distortions, time (duration), and so on.
4. Discuss the content with the class, stressing the important aspects, distortions and weaknesses.
5. Show the tape to the class without interruption. Sit with the learners, thus giving the impression of participation. Don't move about to distract attention.
6. Re-view the tape with students drawing attention to points missed.
7. Show the film again: this time, it may be interrupted to draw attention to particular points, by stopping or pausing sometimes.
8. Individual students could have further playback, if necessary on their own.

The video camera as an educational tool.

The points stated below are strong reasons why you should use the movie camera to teach your class.

1. Tape can record movements in a number of ways which can enhance the range of human vision; for example, slow motion effects.
2. Events which occur at distant places can be presented in the classroom.
3. Events of the past can be preserved and presented at the appropriate time.
4. Students can study when and where convenient.
5. Students can study at their own pace.
6. Tapes can help students to acquire the habit of independent study.
7. Very effective for revision purposes.
8. Learning can be related to 'real life' situations.
9. Filming increases motivation.
- 10.



- 10) Makes it possible to see those things which cannot be seen because they are too small, too large, or move too fast or in hidden places.

Guide to the technical specification of a camcorder.

This section tries to explain, in layman's terms, the technical specification given by camcorder manufactures. This has been presented so you can understand the details of the camcorder and be able to use it to your best advantage.

FORMAT: The format refers to the system of recording used and the type of tape required.

1. VHS-This stands for video home system and is capable of recording on any full size VHS cassette for up to 4 hours.
2. VHS "C" –This is identical to the above except that it will only record on 'C ' or Condensed VHS cassette, usually 20 minutes in duration.
3. Beta – (Betamax). This system is similar to VHS in operation but uses a different size cassette which is not compatible with VHS or VHS 'C'. Its recording is up to 3 hours.
4. Video 8- Also known as 8mm video, this format is the latest development, which uses yet another type of video tape and by far the smallest of all the formats. This type of metal particle type gives better recording quality than the other ferrous oxide type. Recording is at present up to 90 minutes.

Compatibility

Except for the special case of VHS Mini-C and standard VHS noted in (b) above, compatibility between different formats does not exist. That is, tapes of one format can never be played on a machine of another format.

Power source:

This refers to the different sources from which the unit can be powered. That is, batteries or mains operating power units. In Ghana, electrical output is 240 volts.

Power consumption

This is the amount of electrical power used by the unit and is usually expressed in watts and this means that the lower the figure, the longer the running time from a charged battery.

Signal system

There are three different systems in use worldwide. The NTSC system, SECAM and PAL systems. No two systems are compatible and therefore tapes recorded on VHS (NTSC) cannot be played on VHS (PAL).

Recording system

Although this often appears in the specifications, it refers to the technical details of the system and does not affect the choice of machine.

Recording time

An important consideration which is mainly dictated by the tape used and format selected. Maximum times on standard VHS systems is 4hrs

Video input

Many camcorders have a video input socket which is used to record video from other suitable sources. The universal for video signal is IV p-p (peak to peak) into 75ohms unbalanced.

Video output

This also should comply with the universal stated of IV p-p. The provision of a video output socket allows the picture to be copied directly from one to another with the minimum loss of quality.

RF output

Rf means radio frequency and refers to the type of signal accepted at the aerial socket by all domestic television receivers. Most camcorders do not have an Rf output,

however, an RF output adapter is usually available which connects to the camcorder and which enables both pictures and sound to be viewed on a domestic television receiver.

Illumination range

Simply states the minimum and the maximum light levels within which the camera will operate.

Lens

The specification will state the zoom range (that is, 8 – 48 mm or X6) the maximum aperture and whether there is a macro facility.

Viewfinder

This means viewing the camera picture either optically or electronically.

Colour temperature

This measure the colour of light and which is an important feature that must be considered. The higher the temperature, the more “blue” the light contains. The camera should be able to compensate the change in colour at all times.

White balance

Most cameras provide an automatic white balance feature which the user simply has to press while pointing the camera at a pure white card to compensate for changes in colour temperature.

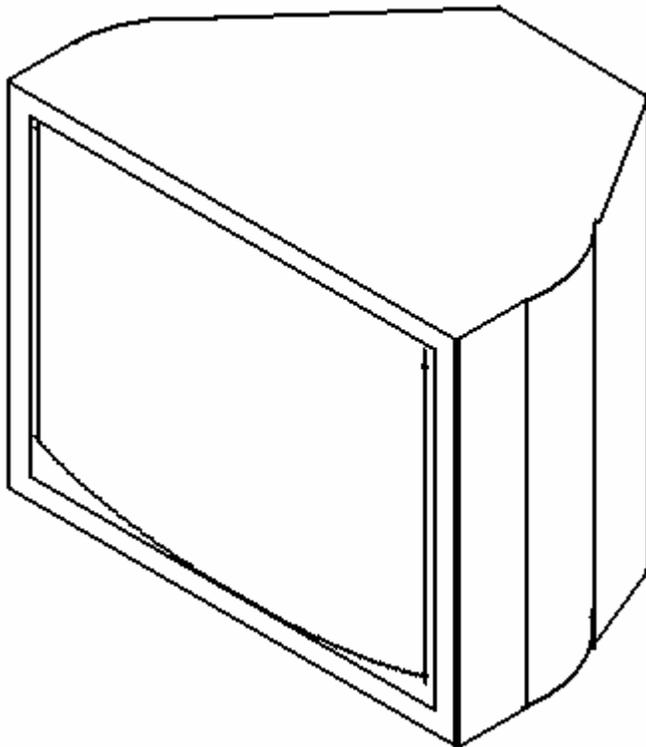
Signal to noise ratio

When a blank audio tape is being played back on a cassette recorder, a hissing noise is heard and when a blank video tape is played back, the television screen is filled with lots of tiny black and white dots that we commonly refer to as snow. Both the

hissing noise and the snow effect is a measure of the signal to noise ratio. The bigger the number, the less noise there will be. 40dB or above is good.

Audio output level

This indicates how sensitive the audio circuit is. A low sensitivity (say 60dB) means that a microphone with high output will be necessary to obtain a sufficient audio signal on tape. A higher sensitivity (say, 75dB) would enable a microphone with lower output to be connected.



CHAPTER ELEVEN

TEACHING WITH COMPUTER

To be able to use the computer in your teaching, you need to have sufficient knowledge about how it looks like and how it works. Then you can use it to your best advantage. The computer is an electronic device capable of receiving data, processing or manipulating the data, storing and retrieving the data at will. This device makes it possible to reach out for information that may not be available to you in your immediate environment either by buying software that has such information or connecting the device to a global network in the same way a telephone is connected word wide.

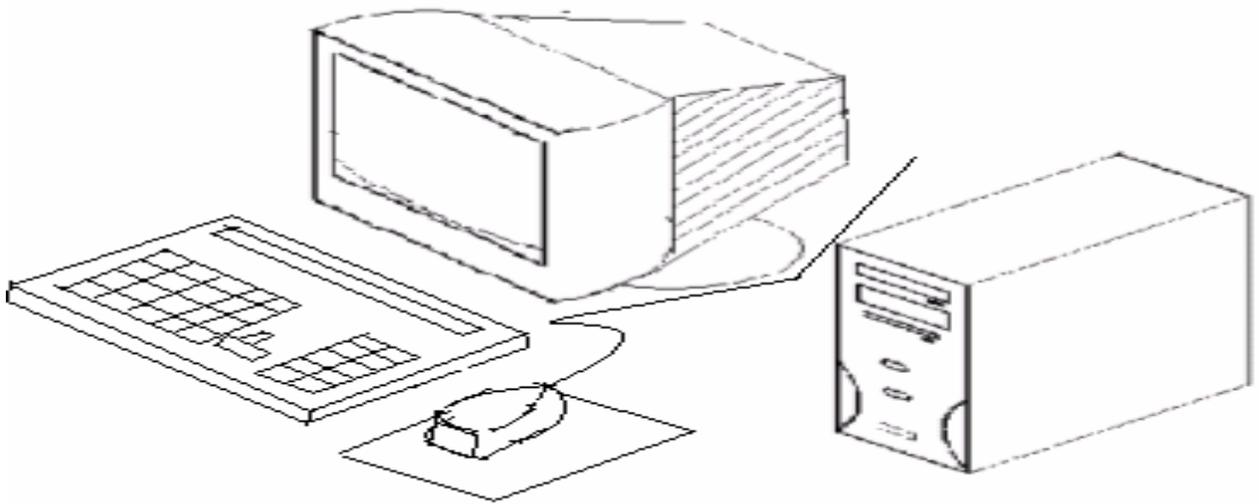
The computer has such basic components to make it function as a central processing unit, a monitor, a typewriter keyboard, a mouse and a printer. The scanner, digital camera, microphone, output speakers, liquid crystal display unit, disk writer and other accessories can be attached for better performance or special functions. All these physical components (machines) mentioned here are referred to as the hardware of the computer system.

The computer works with programmes that are installed in them. Without these programmes, the computer is useless and cannot function. These programmes give instructions that tell the computer how to perform tasks. Software products are written in special codes by programmers. They are either copied onto a storage medium that can be installed by the user or are stored on the computer before they are sold out. With both hardware and software, computers are used to speed up problem solving issues, improve quality in administration of information and increase productivity.

There are two types of software and these are systems software and applications software. System Software helps the computer to manage its own internal functions that

control other hardware devices and to manage the applications software that we use in our daily lives.

Applications Software are those programmes that users use to perform a specific task, for example, Microsoft Word is a word processing software used to prepare and process documents and Power point which is used to project information onto a screen may be for lecture purposes or report presentations.



The two most common computer environments are the IBM and Macintosh. Other computer models include Compaq, Gateway 2000, Dell or Packard Bell and Apple. There are many other machines that are built with computer technologies. Some of these are mobile phones, calculators, some automobiles, fuel automated machines, tale machines and microwave ovens.

All computer systems have inputs, a central processing unit (CPU) and output devices.

Input devices

Input devices allow the operator to enter information, or data, into the computer. Input devices include the keyboard, mouse, stylus, light pen, and scanner. Storage devices can also act as input devices. Input devices can be direct input or indirect input. An operation may choose one input device or a combination of direct and indirect input devices to import, or bringing, data into the computer system.

Direct input involves inputting data manually into the computer. Direct input of data may be done through the use of a keyboard, mouse, or stylus pen. Indirect input involves inputting data electronically into a computer. The most commonly used indirect input device in desktop publishing is the scanner or digital camera.

The inputting of data using a keyboard is also called keyboarding. In keyboarding, the operator strikes keys on an electronic keyboard similar to a typewriter keyboard. The alphanumeric characters and symbols on the keys are translated into corresponding codes to which the computer responds.

Mouse

The mouse is an electromechanical or optical device used for direct input. It is a small hand-held device that allows the user to enter co-ordinate based data (horizontal and vertical location on the screen) into the computer and input programmed commands.

The underside of the mouse contains either wheels, balls, or a laser eye. A mouse with a wheel or ball underneath is a roller mouse. It is maneuvered along a hard horizontal surface of a mouse pad. The optical mouse reads co-ordinates as it moves along a metal pad.

Using a mouse makes it easy to operate or control manually created graphics. In addition, some word processing programmes use a mouse to move easily actively screen commands. A disadvantage of the mouse is that it is cumbersome for free hand drawing. In that case, a stylus pen or light pen could help.

Stylus and light pens

The stylus and light pens are hand-held devices shaped in the form of a writing instrument. They are similar to a mouse in that they are used to input information manually through co-ordinates and programmed commands. As the stylus is drawn along an electronically sensitive pad called a digitizing pad or table, it reads co-ordinates from the pad displayed on a plate. Light pens work interactively with the screen, allowing the operator to use programmed commands.

The advantage of a stylus and light pen is that they are easier to hold than a mouse for drawing and performing graphic functions because of the similarity it has to hold a pen or pencil for writing. The most common use of a stylus and light pen is in designing applications.

Recently video cameras and digital cameras are being used to capture image and transmit them to the computer. Another special device called scanner is used to convert previously printed graphic material into computer images which can be manipulated with special software. Once these images are converted into computer images, they are stored in special files which other programmes can use.

Scanner

A scanner is a device that reads an image and electronically digitizes the image. Digitizing an image is dividing the image into dark and light points by creating codes that a computer can use. There some types of scanners those are worth mentioning. Flatbed, hand-held, sheet-fed and overhead.

Central processing unit

The central processing unit is the brain of the computer without which the computer cannot function. The CPU receives information through the input devices mentioned earlier, stores these for future use and manipulates them as required by the user. The CPU is classified by the memory capacity and speed at which it carries commands. There are two drives that store the information that the CPU received. These are internal memory and on disk drives. The internal memory has two types, the Random Access Memory and the Read Only Memory usually referred to as RAM and ROM. And the types of disk drives are floppy and hard disk drives.

Floppy disk

A floppy disk stores data that can be transported from one computer to another. Floppy disks are available in two formats as 132mm and 90mm disks. Floppy disks are inserted in the floppy disk drive before information can be retrieved from it. Information stored on the floppy disk may be accessed and manipulated by the CPU and resaved into the disk otherwise the data added may get lost. The disadvantage of the floppy disk is that it has a limited memory space and if not handled properly, the floppy disk may get destroyed and information on it may be difficult to retrieve.

Hard disk

The hard disk has much a larger memory space and is like an electronic file cabinet where software programmes and texts and graphic files are stored for future use. The Random Access Memory is the working memory of the computer. RAM is used to temporarily store information from software programme and data while a job is being worked on. The Read Only Memory on the other hand is a permanent memory storage

drive placed in the computer by the manufacturer. All computers contain ROM and this is accessed when the computer is switched on. This contains instructions for the computer on how software programme and data are to be used.

Output device

Output devices allow input material (text and graphics) to be seen as video or electronic text and graphics (soft copy), or produced in printed form as in text books and hand outs (hard copy). Electronic texts and graphics are displayed on the computer monitor for you to see and interpret. You can also produce soft copies when you store the information on disks. The hard copies are done by printing these on paper. The device used to do this is known as the printer. There are a number of printers in the system. These are the dot matrix, laser, image sectors and pen plotters.

Software

Software is the programme that runs the PC system. The software distributes information to all areas of the system and directs each area to complete various functions. It is available in various programmes from simple text programmes to detailed graphics and page layout programmes. The computer code or language that the software uses varies depending on the type of software. When choosing software the type of hardware that will support the software and whether the software is compatible with the output devices must be known. For example, if you intend to use a laser printer, you will have to install the software so the computer can understand its operation and take commands from it. Some types of computer software programmes are the word processing software, the graphics software and the page layout software.

Telecommunications application

Computers can communicate with each other provided they are connected by a network system. It can be connect via telephone lines or by satellite dishes, etc. This technology helps people to share ideas and collect relevant information from the net.

Telecommunication is the transmission of data from one computer to another and this is done the use of modems. Modems are the hard ware devices that convert the digitized signals used by the computer to analog signals used by telephone lines systems.

The process of converting the digital signal of the sending computer to the analog signal is known as modulation and the process of converting analog signal into that of digital signal for the receiving computer is known as demodulation. The combination of these terms MODulation/DEModulation is where the modem gets its name.

Band rate

The amount of time required to transmit one bit of data is called the band rate. Traditionally, the most popular band rates for modems are 300 bad to 1200 band. Newer technologies are permitting band rates of 2400 up to 9600. Once the computers are connected to the net, communication software is used to establish and control the communication between the two systems.

With this connectivity, people can access information within the system. There is the Local Area Network LAN and the Wide Area Network WAN. LAN is where computers within a specified area or region are connected and WAN is where the connection is world wide. Lots of LANs make up the internet. You can get the picture clearly when you imagine a room filled with many spiders spinning their webs to interconnect such that one spider can move from one web mace to another with relative ease. This is how the internet works – a global collection of many different types of computers and computer networks that are linked together. Just as a telephone enables you to talk to someone on the other side of the globe, so does the internet enables a person to sit at the convenience of his home, office, library behind a computer and exchange information with other computers and computer users any place in the world. It offers collections from axiology to zoology, and anything you can think about and which exists.

Internet cafés have sprung up everywhere in the country to meet the new approach and demand for communication exchange. One of the most effective and efficient features of the web technology in vogue today is the electronic mail, popularly known as e-mail. There is yet another feature - Digital Networking. Digital Networking operates through the Internet where it can connect people worldwide with the aid of special computer programmes. One does not need to know how to type in order to communicate with another person when using this technology, even though being a computer literate is a big advantage. The reason being that a web or digital camera attached to the screen or built into the computer screen can capture the image and sound of persons, without necessarily typing and sending the information.

Again, one does not need to be within the confines of a classroom or his immediate environment to be able to access the web. This one advantage makes the Internet a very reliable means of communication, because it can integrate into desktop applications, corporate work flows, and enable with document sharing even after long periods of power - outages. It delivers some of the promises for working anywhere and anytime with anybody.

One of these ways is to project the teaching, with a Liquid Crystal Display (LCD) projector, onto a large screen for a large group of students to have access to. The teacher's notes that are projected on the LCD screens can be printed out to all students. By that, students will concentrate more on the lecture than on copying notes from the

screen. Students will also stop writing out dictated notes given by the teacher as is the case in most situations in the classrooms.

Students do not really need to converge at one point for lectures since they could tune into the programme on the net in their individual cubicles, or rented rooms as the case may be, to receive lectures. Of course, individual interactions with the lecturers concerned usually follow the said lectures and this is a good start to ease the congestion in lecture theatres.

Digital networking (or Web Video Technology) has other interesting features. It can present information in visual form in its natural colours and size (in relation to the natural environment) and in motion, synchronized with sound over a large coverage area worldwide. Apart from Virtual Reality, it is the most advanced universal medium of communication developed so far, which enables an individual to study on his or her own. For this reason, it is usually recognized as a 'self directed' form of learning. Some of the modern sophisticated mobile phones can also perform such functions. As such, if we integrate this technology into our educational system, we will overcome some, if not all, of the problems associated with teaching and learning.