**EDU 332
INTRODUCTION TO EDUCATION TECHNOLOGY**

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NATIONAL OPEN UNIVERSITY OF NIGERIA

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INTRODUCTION

EDU 332: Educational Technology is a first semester year one, two credit and 300 level core course. It will be available for all students offering undergraduate education programmes in the School of Education.

This course will expose you to the understanding of many concepts and theories in educational technology as they affect the teaching profession in Nigeria. It will assist you to be able to apply the concepts and theories to the task and roles that you are expected to perform as a teacher in private and public educational institutions.

COURSE GUIDE

The course guide tells you briefly what the course is about, what course materials you will be using and how you can work your way through the study materials. It suggests some general guidelines for the amount of time you are likely to spend on each unit of the course to complete it successfully.

It also gives you some guidance on the tutor-marked assignment which will be made available to you at the Study Centre. There are regular tutorial classes that are linked to the course. You are advised to attend these sessions.

WHAT YOU WILL LEARN IN THIS COURSE

The course EDU 332 consists of 15 units. Specifically, the course discusses the following:

- Meaning of Educational Technology
- Instructional Technology
- History of Educational Technology
- Historical Development of Educational Technology in Nigeria
- The Communication Process
- Definition of Terms
- Systems Approach
- Factors or Methods, Media Selection, Time and Evaluation
- The Place of Information and Communication Technology in Distance Education
- Educational Resource Centres (ERC)
- Techniques of Instructional Media Production
- Improvisation
- Lettering

- Production of Audio Media
- Production of Visual and Audio Visual Media
- Photography
- Instructional System Design and Development.

COURSE AIMS

This course aims to give you an understanding of the meaning of educational technology issues and theories, what they are and how they can be applied in teaching. It also aims to help you develop skills in information and communication technology. The course will expose you to the required knowledge and skills for the production of improvised instructional materials.

COURSE OBJECTIVES

To achieve the aims set out, the course sets overall objectives. Each unit also has specific objectives. The unit objectives are always specified at the beginning of a unit; you should read them before you start working through the unit. You may want to refer to them during your study of the unit to check your progress.

You should always look at the unit objectives after completing a unit. When you do that, you will ensure that you have followed the instructions in the unit.

Below are the overall objectives of the course. By meeting these objectives, you should have achieved the aims of the course as a whole. On successful completion of the course, you should be able to:

- explain the meaning of such terms as educational technology, instructional technology, technology I, technology II and technology III
- trace the historical development of educational technology at the local and global levels
- identify and discuss the various elements of communication process
- apply the principles of communication process to classroom situation
- define systems approach and discuss the various principles of systems approach
- explain the need for including ICTs into teacher education programme
- produce instructional materials

- justify the need for the inclusion of EDU 332 in teacher education programme in Nigeria.

WORKING THROUGH THIS COURSE

To complete this course, you are required to read the study units, set books and other materials provided by the National Open University of Nigeria (NOUN). Each unit contains self-assessment exercises, and at a point in this course, you are required to submit assignments for assessment. At the end of the course, there will be a final examination. The course should take you a total of 16 – 17 weeks to complete. The components of the course are listed below. You also have what to do and how you should allocate your time to each unit in order to complete the course successfully on time.

COURSE MATERIALS

Major components of the course are:

- Course Guide
- Study Units
- Textbooks
- Assignment
- Presentation Schedule

STUDY UNITS

The study units in this course are as follows:

Module 1   Educational Technology

Unit 1   Meaning of Educational Technology
Unit 2   Instructional Technology
Unit 3   History of Educational Technology: Global Perspectives
Unit 4   Historical Development of Educational Technology in Nigeria
Unit 5   The Place of Information and Communication Technology in Distance Education
Unit 6   Educational Resource Centres (ERC)

Model 2   Instructional   Communication   Systems   and Development

Unit 1   The Communication Process
Unit 2   Types and Models of Communication
Unit 3   Instructional Systems Design: Definition of Terms

Unit 4   Systems Approach
Unit 5   Factors or Methods, Media Selection, Time and
               Evaluation in Instructional Systems Design and
               Development

Module 3   Instructional Media Production

Unit 1   Techniques of Instructional Media Production
Unit 2   Improvisation
Unit 3   Lettering
Unit 4   Production of Audio Media
Unit 5   Production of Visual and Audio Visual Media
Unit 6   Photography

THE ASSIGNMENT FILE

A number of self assessment exercises and 15 assignments have been prepared to help you succeed in this course. The exercises will guide you to have understanding and good grasp of the course.

THE PRESENTATION SCHEDULE

The presentation schedule included in your course materials also have important dates of the year for the completion of Tutor-Marked Assignments (TMAs) and attending tutorials.

Remember, you are required to submit all your assignments by the due date. You should guard against falling behind in your work.

ASSESSMENT

There are two aspects to the assessment of the course: first are self-assessment exercises, second are the Tutor-Marked Assignments; and third, there is also a written examination.

In tackling the assignments, you are expected to apply information, knowledge and techniques gathered during the course. The assignments must be submitted to your tutor for formal assessment in accordance with the deadlines stated in the **Presentation Schedule** and the **Assignment File**. The work you submitted to your tutor will count for 30per cent of your total course mark.

At the end of the course, you will need to sit for a final written examination of 'three hours' duration. This examination will also count for 70per cent of your total course mark.

TUTOR-MARKED ASSIGNMENTS (TMAs)

Each of the units in the course material has a tutor-marked assignment (TMAs) in this course. You only need to submit five of the eight assignments. You are to answer all the TMAs and compare your answers with those of your course mates. However, you should ensure that you collect four TMAs from the Study Centre. It is compulsory for you to answer four TMAs and submit them for marking at the Study Centre. Each TMA is allocated a total of 10 marks. However, the best three of the four marks shall be used as your continuous assessment score.

You will be able to complete your assignment from the information and materials contained in your reading, references and study units. However, it is desirable in all degree level education to demonstrate that you have read and researched more widely than the required minimum. Using other references will give you a broader viewpoint and may provide a deeper understanding of the subject.

FINAL EXAMINATION AND GRADING

The final examination for EDU 332 will not be more than three hours' duration and has a value of 70per cent of the total course grade. The examination will consist of questions, which reflect the types of self-testing, practice exercises and tutor-marked problems you have previously encountered. All areas of the course will be assessed.

Use the time between finishing the last unit and sitting for the examination to revise the entire course. You may find it useful to review your self-tests, tutor-marked assignments and comments on them before the examination. The final examination covers information from all parts of the course.

COURSE MARKING SCHEME

Total Course Marking Scheme

Table 1:   Course Marking Scheme

ASSESSMENT	MARKS
Assignment 4 (TMAs)	Best three marks of the 4 TMAs @ 10 marks = 30 marks of course = 30%
Final Examination	70% of overall course marks
Total	**100% of course marks**

COURSE REVIEW

This table brings together the units and the number of weeks you should spread to complete them and the assignment that follow them are taken into account.

Unit	Title of work	Weeks activity	Assessment (end of unit)
	Module I		
1	Meaning of Educational Technology	1	Assignment 1
2	Instructional Technology	1	Assignment 2
3	History of Educational Technology (Global)		
4	Historical Development of Educational Technology in Nigeria	1	Assignment 3
5	The Place of Information and Communication Technology in Distance Education		
6	Educational Resource Centres (ERC)		
	Module II		
1	The Communication Process	1	Assignment 4
2	Models of Communication	1	
3	Instructional Design and Development	1	
4	Systems Approach	1	Assignment 5
5	Factors or Methods, Media Selection, Time and Evaluation in Instructional System Design and Development	1	
	Module III		
1	Techniques of Instructional Medial Production	1	Assignment 6
2	Improvisation	1	
3	Lettering	1	Assignment 7
4	Production of Audio Media	1	Assignment 8
5	Production of Visual and Audio Visual Media	1	
6	Photography	1	Assignment 9
	Revision		
	Total	**9**	

HOW TO GET THE MOST FROM THIS COURSE

In distance learning, the study units replace the university lecturer. This is one of the great advantages of distance learning. You can read and work through the specially designed study materials at your own pace,

and at a time and place that suits you best. Just as a lecturer might give you an in-class exercise, you study units also provide exercises for you to do at appropriate points.

Each of the study units follows a common format. The first item is an introduction to the subject matter of the unit, and how a particular unit is related with the other units and the course as a whole.

Next is a set of learning objectives. These objectives let you know what you should be able to do by the time you have completed the unit. You should use these objectives to guide your study. When you have finished the unit, you must go back and check whether you have achieved the objectives. If you make a habit of doing this, you will significantly improve your chances of passing the course.

The main body of the unit guides you through the required reading from other sources. This will usually be either from ***Reading Section*** or some other sources.

Self-tests are interspersed throughout the end of units. Working through these tests will help you to achieve the objectives of the unit and prepare you for the assignments and the examinations. You should do each self-test as you come to it in the study unit. There will also be numerous examples given in the study units, work through these when you come to them too.

The following is a practical strategy for working through the course. If you run into any trouble, telephone your tutor. When you need help, don't hesitate to call and ask your tutor to provide it. In summary,

Read this course guide.

1.   Organise a study schedule. Refer to the course overview for more details. Note the time you are expected to spend on each unit and how the assignments relate to the unit. Important information e.g. details of your tutorials, and the date of the first day of the semester is available. You need to gather together all information in one place, such as your diary or a wall calendar. Whatever method you choose to use, you should decide on and write in your own dates for working on each unit.
2.   Once you have created your own study schedule, do everything you can to stick to it. The major reason that students fail is that they get behind with their coursework. If you get into difficulties with your schedule, please let your facilitator know before it is too late for help.

3. Turn to unit 1 and read the introduction and the objectives for the unit.
4. Assemble the study materials. Information about what you need for a unit is given in the 'Overview' at the beginning of each unit. You will always need both the study unit you are working on and one of your set books, on your desk at the same time.
5. Work through the unit. The content of the unit itself has been arranged to provide a sequence for you to follow. As you work through this unit, you will be instructed to read sections from your set books or other articles. Use the unit to guide your reading.
6. Well before the relevant due dates (about 4 weeks before the dates) access the Assignment file on the Web CT OLE and download your next required assignment. Keep in mind that you will learn a lot by doing the assignments carefully. They have been designed to help you meet the objectives of the course and, therefore, will help you pass the examination. Submit all assignments not later than the due dates.
7. Review the objectives for each study unit confirm that you have achieved them. If you feel unsure about any of the objectives, review the study material or consult your tutor.
8. When you are confident that you have achieved a unit's objectives, you can then start on the next unit. Proceed unit by unit through the course and try to pace your study so that you keep yourself on schedule.
9. When you have submitted an assignment to your tutor for marking, do not wait for its return before starting on the next unit. Keep to your schedule. When the assignment is returned, pay particular attention to your facilitator's comments. Consult your tutor as soon as possible if you have any questions or problems.
10. After completing the last unit, review the course and prepare yourself for the final examination. Check that you have achieved the unit objectives and the course objectives.

TUTORS AND TUTORIALS

There are eight (8) hours of tutorials provided in support of this course. You will be notified of the dates, times and location of these tutorials, together with the names and phone number of your tutor, as soon as you are allocated a tutorial group.

Your tutor will mark and comment on your assignments, keep a close watch on your progress and on any difficulties you might encounter as they would provide assistance to you during the course. You must mail your tutor-marked assignments to your tutor well before the due date (at least two working days are required). They will be marked by your tutor

and returned to you as soon as possible. Do not hesitate to contact your tutor by telephone, e-mail, or discussion board if you need help. The following might be circumstances in which you would find help necessary.

Contact your tutor if:

- you do not understand any part of the study units or the assigned readings
- you have difficulty with the self-tests or exercises
- you have a question or problem with an assignment with your tutor's comment on an assignment or with the grading of an assignment.

You should try your possible best to attend the tutorials. This is the only chance to have face-to-face contact with your tutor and to ask questions which are answered instantly. You can raise any problem encountered in the course of your study. To gain the maximum benefit from course tutorials, prepare a question list before attending them. You will learn a lot from participating in discussions actively.

SUMMARY

As earlier stated, the course EDU 332: Educational Technology is designed to introduce you to various techniques, guides, principles, practices etc. relating to information and communication technology as well as the nitty-gritty of computer operations as it affects the teaching profession in Nigeria.

We hope you enjoy your acquaintances with the National Open University of Nigeria (NOUN). We wish you every success in the future.

**MAIN
COURSE**

CONTENTS   PAGE

MODULE 1   EDUCATIONAL TECHNOLOGY:
**   CLARIFICATION OF CONCEPTS**

UNIT 1   MEANING OF EDUCATIONAL TECHNOLOGY

CONTENTS

1.0   INTRODUCTION

Has it ever occurred to you to ask yourself the meaning of the name you
bear? This is considered natural and indeed necessary. You must have

noticed within your community that some individuals have cause to change their names for reasons not known to you aside from marital reason, especially among the women-folk.

Experience has shown that some people resorted to changing their names when they discovered that they did not like the meaning of the initial name given to them at birth. Indeed, the name one bears suggests to the world some expectations from the bearers.

In this unit, the meaning of the course title 'Educational Technology' shall be provided. You are to take note of some terminologies and concepts used in the course of the discussion.

2.0   OBJECTIVES

At the end of this unit, you should be able to:

- define educational technology
- describe the two major aspects of educational technology and provide relevant examples of each
- discuss at least four major concepts/terminologies that are wrongly used to describe educational technology
- discuss the relevance of psychology to educational technology.

3.0   MAIN CONTENT

3.1   Meaning of Educational Technology: Wrong Interpretations

Educational Technology, as a concept, and as a field of study has come of age. Nonetheless, its correct meaning has always constituted problems to many people. Heimlich, Michael, James and Sharon (2002) recognised this fact and said that their efforts at explaining the meaning of educational technology started with the attempts to explain what the discipline is not.

SELF-ASSESSMENT EXERCISE 1

What does the term "Educational Technology mean to you?

Compare your response to activity one above with that of some of your study group members, you will note the different answers that have been given from different perceptions. Each of you has also defined what constitutes the meaning of the concept – educational technology.

As you will soon realise, a large percentage of the meanings that you have given will be incorrect interpretation of the concept under discussion. However, if your answer is found to tally with what is regarded as the correct interpretation of the concept here, then, accept my congratulations.

There are a lot of misconceptions as regards the meaning of educational technology. To many, it is a discipline associated with the use of audiovisual media in education. Some use the term software and hardware as synonyms of educational technology whereas; some people are comfortable with the term teaching machines as the meaning of educational technology. In Nigeria, the differences in the two disciplines of "introductory technology and educational technology or instructional technology" are often overlooked. The truth of the matter is that none of the above could actually be taken as correct interpretation of the meaning of educational technology concept.

SELF-ASSESSMENT EXERCISE 2

List three wrong nomenclatures used to mean educational technology.

3.2   Literary Interpretation of Educational Technology

A further attempt at explaining the meaning of educational technology is to provide the literal interpretation of the two major concepts of "education" and "technology" (the two concepts that are fused together that provide the name "educational technology").

"Education" is another elusive term that means many things to many people. According to Oxford English Dictionary (2000), the term means "a process of teaching, training and learning, especially in schools or colleges to improve knowledge and develop skills". There seems to be a consensus among definers of the term education. Education is regarded as "that which is given to an individual to make him develop socially, morally, and intellectually as to allow for his/her personal overall development and the development of the community in which he/she finds himself/herself". By implication, education, whether formal or informal, is goal-oriented. It is to be functional, qualitative and socio-personal driven. Socio-personal in the sense that it must be tailored toward serving the society and the personality involved. This accounts for why every society is concerned and deeply involved in the content and quality of education given to the individuals in the society. It is because of the role attributed to education by the society that account for its being defined as "transmission and renewal of culture from one generation to another".

"Technology" on the other hand, is simply defined by the Oxford English Dictionary as "a body of knowledge which when used / applied helps in solving problems".

One can then infer, from the literal point of view, that educational technology means "application of a body of knowledge (technology) to solving educational problems. Adeyanju (1999), Balogun and Abimbade (2002) are of the opinion that "the contributions of technology to education constitute or mean educational technology."

3.3   Specialists Interpretation of Educational Technology

The specialists in educational technology seem not to be satisfied with the literal meaning of the term educational technology. This may not be unconnected with the fact that the concept is not easily associated with one universally accepted definition. Again, the literal meaning looks rather too simple and lacks some "jaegers" associated with other disciplines like law, sociology, and psychology, etc. Thus, according to the specialists, educational technology can be explained by looking at the two major components of the concept "technology in education" and "technology of education".

SELF-ASSESSMENT EXERCISE 3

What do you understand by these terms?

i.   Technology in Education?
ii.   Technology of Education?

3.4   Technology in Education

By the term "technology in education" is meant application of machines, gadgets or equipment to improve the quality of education. This aspect is described as the "hardware" approach to educational technology. It involves the use of pieces of instructional materials (media) such as audio media, visual media, projected media, graphics, computers and other teaching machines. It is important to note that hardware/machines are means through which information are extracted from their corresponding software.

3.4.1 Audio Media

These are teaching-learning devices that appeal to the auditory sense. They consist of radio sets; audio recording machines such as audiotapes, disc machines, telephone and walkie-talkie.

3.4.2 Visual Media

These are instructional media that appeal to the sense of seeing (eyes). Most graphics are in this family of instructional media. They include: pictures, photographs, diagrams, charts and cartoons, still pictures such as slides, filmstrips and transparencies.

3.4.3 Audio-visual Media

These are instructional materials that have the capacity to provide issues in form of pictures and audio effect, in form of commentaries on the pictures simultaneously. Examples of media in this category are: the television, videotape player, filmstrip/slides with in-built or synchronized sound.

3.4.4 Broadcast / Telecommunication Media

These are media through which information is disseminated usually to the people / audience that are scattered over a wide distance. Common among the family of mass media are: the radio, the television, and the newspapers. The two former ones are in electronic forms while the latter is the print form.

3.4.5 Projected Media

Projected media belong to a group of instructional resources which can only be accessed by means of projecting their content on the screen/wall using a projector machine specifically designed for the purpose. Therefore, projected media are usually a combination of software and the corresponding hardware. You may have watched a cinema or a film in a cinema house or at some gathering. Recall that there was an equipment/machine that was used to propel a scroll of film. In addition, you will recall that the machine was energized through a power source – direct current or the use of a generator. Your experience has provided you with all that we can use to explain the meaning of projected media. From your experience, consider the machine that was used to propel the scroll of the film as the "hardware". The "film" which contains the content or the message to be disseminated is referred to as the software
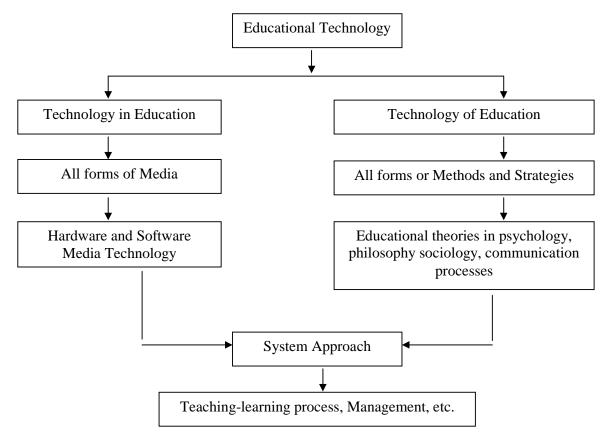
What we need to know is that all projected media are designed to be transmitted on the screen through the use of projectors. Examples of such projectors are: slide projector, overhead projector, video projector, 16mm projector, 8mm projector, 35mm projector, filmstrip projector, opaque projector among others. It should be pointed out that most of the named projectors are fast becoming obsolete due to technological advancement and the advent of computer age.

Pictures of the under listed projected equipment are as shown below:

1.   8mm projector
2.   Overhead projector
3.   Computers
4.   Audiotape player/recorder
5.   Videotape player/recorder

3.5   Technology of Education

The term "technology of education" refers to application of theories and laws/rules in education and related disciplines for the purpose of improving the quality of education. Such related disciplines include: sociology/sociology of education, philosophy/philosophy of education, psychology/psychology of education, communication, technology, etc. Technology of education is a component of educational technology that is involved in the use of systems approach to promote high quality education. Furthermore, this aspect of educational technology is concerned with the use of systematic and scientific procedures in educational practice. Simply put, technology of education refers to the application of the systems approach to educational enterprise. Its main concerns include issues bothering on identification of educational problem, analysing the problem, setting objectives, suggesting solution strategies, synthesising the processes, embarking on evaluation and providing feedback.

At this junction, it is to be noted that a combination of the meaning of technology in education and technology of education will provide a fairly acceptable/description of educational technology.

Specialists Interpretation of Educational Technology

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│ Technology in Education│                 │ Technology of Education│
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            ▼                                          ▼
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│   All forms of Media  │                 │ All forms or Methods and  │
│                       │                 │        Strategies         │
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┌───────────────────────┐                 ┌───────────────────────────┐
│ Hardware and Software │                 │ Educational theories in   │
│   Media Technology    │                 │ psychology, philosophy    │
│                       │                 │ sociology, communication  │
│                       │                 │        processes          │
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               │    System Approach    │
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        ┌──────────────────────────────────────────┐
        │ Teaching-learning process, Management, etc.│
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Source: Balogun and Abimbade (2002), Agun and Imogie (1988)

3.5.1 Psychological Basis of Educational Technology

As a discipline and in line with the dictate of technology of education, educational technology draws a lot from the field of psychology in general and psychology of learning in particular. The works of such Psychologists such as B.F. Skinner, Pressey and Watson greatly influenced the method and practice of educational technology. Indeed, the influence of the behaviourist psychologists mentioned above has far-reaching effect on educational technology. The works of B.F. Skinner in the production of the teaching machines led to massive involvement of educational technologists in the production of more sophisticated teaching machines. Again, Skinner's involvement in Programmed Instruction (Skinner, 1968) led to modern trials in production of Programmed Instructional Packages and Machines. The behaviourists' interest in research and experimentations in mastery learning based on the principle of individualisation has metamorphosed into modern-day application of modular instructional packages as well as adoption of

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high technological-based distance education mode of information dissemination to a mass of populace.

The works of the behaviourists led to such theory as reinforcement that has led to propagation of reward by the educational technology experts in their efforts at designing instructional packages. Whether in live classroom teaching or mediated instructional process, an instructional designer knows that it is imperative to build on an effective "reward" strategy.

Thus, in computer-assisted designed programme, such words like correct, right, good, splendid etc. after remittance of correct response are built into the package because such words when used have the potentiality of encouraging better performance of learners at a later time. Adherence of specialists in educational technology to the use of principle of Immediate Knowledge of Result (IKOR) was not unconnected to the work of the behaviourists or linguists. Because of this, rewards whether symbolic or not are usually provided immediately after a correct response.

Psychological laws such as "readiness" which emphasise that learners learn a task better and easier when they are mature for the task from psychological, physiological, and intellectual points of view has been found applicable in the design of instructional packages by educational technologists. You must have discovered that the course material you are reading follows a pattern that allows you to move from a simpler concept to a more complex one. You would have also observed that by now you have been given some activities meant to assist you to recall and practice what you have learnt. This is a direct reflection of the work of experts in psychology of learning. It was said by Watson (1977) and reported by Salawu, Taiwo and Aremu (1994) that:

- "Learning from reading is facilitated more by time spent recalling what has been read than by reading as students who spent 80 per cent of their learning periods trying to remember what they had read, surpassed those who spent only 60 per cent of the time on recollection. The students who spent all the time reading and re-reading the assignment made the poorest record". (p. 10).

SELF-ASSESSMENT EXERCISE 4

In your study group, have a brainstorming session on the relevance of at least two psychological theories / laws / principles to educational technology.

3.5.2 Philosophical Basis of Educational Technology

The definition of educational technology that has enjoyed general acceptability is that which defines it as "a systematic way of designing, planning, implementing and evaluating the total process of teaching and learning based on specific objectives using human and non-human elements together with application of communication theories to achieve predetermined objectives.

It can also be defined as a systematic and scientific approach to identification of educational problems using human and non-human elements in the designing, planning, implementing and evaluating the solution strategies aimed at a better performance of the educational system.

By its very nature, educational technology is an eclectic discipline. By being eclectic is meant that the disciplines have elements of some other disciplines in it. You will remember in our definition of educational technology, we made reference to other specialised areas like philosophy, sociology and communications/information and communication technology. Indeed, other disciplines from where educational technology shares content and methods include library science and archival studies.

However, for this purpose, attention shall be focused on philosophy and philosophy of education. Like the sub-title has suggested, we shall briefly discuss the relationship between philosophy and educational technology. You would gain a deep knowledge of the philosophy of education in the course of your study.

Philosophy has been variously and variedly defined. Unah (2001) provided a summary of the various definitions as:

- Philosophy is the love of wisdom
- Philosophy is the search for reality
- Philosophy is the search for truth
- Philosophy is the search for value or the search for the best form of life
- Philosophy is the rational study of nature
- Philosophy is the critical discussion of received ideas, and
- Philosophy is the concern with human existence.

A critical analysis of all the definitions of philosophy as given showed that philosophy has a lot to offer educational technology. You may want to ask a pertinent question – In what way(s)?

Fine, if you consider educational technology as a discipline that is interested in solving educational problems using systems approach, then some philosophical questions such as:

- What is the problem to be solved?
- How is the problem to be solved?
- What are the things needed to solve the problem?
- Why do we regard the problem as such?
- What are we going to gain by solving the problem? etc.

You will begin to understand the relationship between philosophy and educational technology.

Again, because philosophy is a discipline which is based on reflection on human experience, you will understand that human experience cannot be explained by words of mouth only.   There is the need to show in concrete terms some of the abstract experiences being described. The reality of this is felt in the writings of a great renowned philosopher such as John Amos Comenius (1652 – 1670) who wrote the book "Orbit Picture" and the Great Didactics, John Locke who was the chief proponent of functional education, Rousseau (1712 – 1788) postulated that education should be child-centred, John Lancaster was reported for the introduction of the use of bold letters in writing and the use of different colours in chart preparation, John Pestalozzi (1746 – 1827) devised the method of learning from concrete to abstract. This was re-emphasised by Edgar Dale (1964) with the pyramidal model of degree of concreteness in instructional media. Maria Montessori (1870 – 1952) recommended that learning should not only take cognizance of the child-developmental stages but teaching-learning process should be play-centred.

Suffice to summarise that the contributions of each of the above philosophers and of course, several others not mention have a lot of impact on not only the content of educational technology as a discipline but also the nature, structure and research methodology.

3.6   Dimensions of Educational Technology

Attempts to further provide fuller description of educational technology has led to the emergence of three dimensions of educational technologies (Davids, 1975 and Plump and Pals (1989).

3.6.1 Educational Technology I (ET I)

This dimension of educational technology focuses more on physical media that are designed and developed to improve the quality of teaching-learning process.

This refers to the use of instructional materials of all categories to facilitate learning (Afolabi, 2008). It can also be called the hardware approach to teaching and learning. In short, ET(I) is synonymous to the meaning we gave to Technology in Education earlier in this unit.

3.6.2 Educational Technology II (ET II)

The meaning of this dimension of educational technology is closely related to the one we earlier provided in the discussion of Technology of Education. Indeed, the major difference between the two concepts is that of nomenclature (names). ET (II) therefore refers to all strategies, techniques and means through which instructions are designed, planned, implemented and evaluated. It does not exclude integration of laws and rules especially in the field of education for proper integration and utilisation of media for better results.

3.6.3 Educational Technology III

This is an amalgam of Educational Technologies I and II that seeks to produce desirable effect. This aspect of educational technology is usually attributed to philosophical and holistic orientation based on the concept of problem analysis and goal achievement. Simply put, Educational Technology III has its roots on the systems theories and applications.

This aspect attempts at putting man and machine efforts together to improve the quality of instruction. It has led to a popular concept known as "Systems Approach". You would learn more about this concept in the subsequent units.

4.0 CONCLUSION

Educational technology is a discipline that is difficult to define. Its meaning can be derived from the two components of technology in education and technology of education. It is an eclectic discipline that borrows from such educational fields like psychology, sociology and philosophy.

5.0   SUMMARY

Attempts have been made in this unit to present the four levels at which educational technology can be described. Copious examples of media in the aspect of technology in education were provided while efforts are made to explain the concept of technology of education. A working definition of educational technology was also provided.

6.0   TUTOR-MARKED ASSIGNMENT

Attempt an acceptable description of educational technology as a field of study.

7.0   REFERENCES/FURTHER READING

Adeyanju, R. J. (1999). *Basic Concepts in Educational Technology*. A Handbook for Pre-service and In-service Teachers in West African Countries. Winneba-Ghana.

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UNIT 2   INSTRUCTIONAL TECHNOLOGY

CONTENTS

1.0   Introduction
2.0   Objectives
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5.0   Summary
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1.0   INTRODUCTION

An understanding of the concept educational technology without a thorough grasp of a related concept like instructional technology is considered grossly inadequate. You, like many other teachers, will be operating most of the time with your basic knowledge of instructional technology as you will soon realise. The common error of using the two terms interchangeably by many people needs to be examined and corrected.

2.0   OBJECTIVES

By the end of this unit, you should be able to:

- establish the relationship between educational technology and instructional technology
- define instructional technology
- list and discuss the roles of instructional technology in teaching and learning process
- differentiate among such terms as: instruction, education, learning etc.

3.0   MAIN CONTENT

3.1   Instruction

In Unit 1, it was mentioned that education is an elusive term. It is a concept that is very broad in nature. It is used to cover such concepts like curriculum, instruction, methodology, evaluation and administration of schools. The task of explaining "instruction" is by no means easier as it is also a concept that has been variedly interpreted.

To many people, as observed by Oluokun and Olayanju (2000), there appears not to be a difference between instructing and teaching. According to Macmillan School Dictionary (2000), the word "instruction" means a statement of something that must be done, or an explanation of how to do or use something. The same dictionary defines an instructor as "someone whose job is to teach a skill or a sport". It is obvious from these two definitions that it behooves on whoever is instructing to resort to teaching. Therefore, instruction means the efforts of somebody who is superior in knowledge, skills and attitude to plan, design, implement and evaluate the teaching-learning process for the benefit of the recipients (learners).

SELF-ASSESSMENT EXERCISE

What is educational technology from the literary point of view?

3.1.1 Teaching

As a term, it has a long history of usage. Surprisingly, the term has been erroneously misunderstood to mean an act by anybody who is assumed to be knowledgeable to disseminate information to others. It is this wrong interpretation of the term that has led to the appointment of many unprofessionally qualified people performing the task of teaching.

Teaching is a serious business. It is very tasking and highly demanding. It is an art of passing knowledge by way of deliberate arrangement of the task to be learnt, the method(s) to be adopted, the material(s) to be used, the learners, the evaluation as well as the entire teaching-learning environment in a manner that will provide learning arising from the interactions.

It is common saying that "teachers are born" or rather the saying "born teacher". Of course, since teachers are human beings, they are born. However, "a born teacher" if there is any at all, will perform better with good teacher education background/exposure.

Teaching is expected to produce learning. Therefore, any teaching activity which fails to produce the desired outcome (learning) is not to be taken as teaching. Mind you, there could be reasons or several factors that may inhibit learning to occur even when adequate preparation is made for a lesson, but if the lesson fails to lead to learning on the part of the learner(s), no other word would describe the titration better than to say learning has not occurred.

You are therefore encouraged to engage yourself in teaching-learning process that will venture achievement of the stated objectives. You will be assisted to acquire the basic principles of effecting good teaching in the course of going through this study material.

3.1.2 Learning

Learning is a relatively permanent change in human behaviour arising from experience. The expression "relatively permanent" is used to connote the expectation of the time lag of change in behaviour. The change is expected to be noticed in the person that has acquired the new knowledge for a very long period. It should be part and parcel of him until and unless the acquired knowledge/skill becomes rather obsolete, archaic, and therefore no longer relevant. The term "behaviour" is indicating where to measure the acquisition of the new knowledge. We are not interested in the physical change but in attitudinal change.

Again, the change in behaviour should be an outcome of the learner's interaction with the environment rather than an outcome of natural biological changes such as maturations, growth and development.

For learning to take place, learning environment must be sufficiently made conducive. It must be rich in resources as to provide learning experiences needed by the learner for the expected learning outcomes. The use of different forms of media ranging from audio to visual, audiovisual, model, mock-ups, graphics, projected, non-projected, and realia (real objects) will encourage enabling environment and experiences that can promote learning.

3.1.3 Instruction

Instruction is a subset of teaching. Teachers in their effort to assist learners acquire new knowledge, skills or attitudes do resort to asking them to do certain things, as a form of "order". Learners could be asked to follow some steps to enable them arrive at a particular point by the teacher. Instructions, if not skillfully done, would kill learners' initiatives and thereby encourages dogmatism. However, in a task

where strict compliance to rules and regulations are expected, the use of instruction could not be ruled out.

3.1.4 Indoctrination

This is an act of deliberate killing of learners' reasoning ability. The indoctrination does not give room for the person indoctrinated to reflect and make a choice. Teaching done in this form negates the principle of democratisation and therefore should not be encouraged. Indoctrination does not allow the learners to be creative and original. It is purely teacher-centred as such it is not a favoured practice by educators.

3.2   Instructional Technology

Instructional technology is a subset of educational technology. Instructional technology is narrower in scope than educational technology. However, both concepts are related. While educational technology principles can be applied to solving educational problems at the macro level, instructional technology principles can be applied to solving instructional problems at the micro level.

Problems such as designing a new curriculum, designing a new programme, finding solutions to the problem of mass failure, conduct of large scale examinations, recruitment of new teachers, designing a policy on establishment of resource centres/libraries at the national level etc. are those to be tackled at the realm of educational technology. However, instructional problems such as management of teaching-learning situation at the classroom level, deciding on choice of instructional media, methods, topic etc. is in the sphere of instructional technology. It is evident therefore that instructional technology is subsumed in educational technology. Instructional technology can be defined as a systematic way of planning, designing, implementing and evaluating the total process of teaching and learning based on specific instructional objectives, using available human and non-human elements to improve the quality of instruction.

3.3   The Roles of Instructional Technology

The roles of the various instructional technology media in teaching and learning process cannot be underestimated. The under listed are what Karimu (2008) considered as the advantages of media utilisation in instruction:

1.   Increase the rate of learning and at the same time allow the teacher to use more time on other gainful activities

2. Reinforce verbal and visual messages. Pupils would generally find it difficult to understand abstract ideas discussed by their teachers. However, if the abstract ideas are put in form of models, pictures, etc. pupils understand them with ease and they remain permanent in their memories

3. Through the use of media, emphasis is placed on realistic learning rather than rote learning

4. Instructional media have a way of motivating and arresting pupils' attention. Pupils' curiosity and consciousness get increased and thereby provide a sound environment for realistic and enjoyable teaching and learning atmosphere

5. Terms and concepts that are abstract are best illustrated through the use of instructional media.

There are many other advantages which you should find out.

4.0 CONCLUSION

The major task of a teacher is done in the classroom where he/she is with the learners, with the purpose of effecting learning. In order for him/her to accomplish this role, he/she needs to comprehend and put into practice the principles of instructional technology. Even as teacher-manager, the knowledge of instructional technology is considered vital.

5.0 SUMMARY

In this unit, you have studied the various concepts related to instructional technology. You have become aware of those practices that are favoured as well as those that are not favoured by educators.

A distinction between educational technology and instructional technology was made. A working definition of instructional technology was provided while the roles of instructional technology in teaching and learning process were highlighted.

6.0 TUTOR-MARKED ASSIGNMENT

1. Distinguish clearly between the following terms:

   a. educational technology, and
   b. instructional technology

2. Of what relevance is instructional technology in teaching and learning process?

7.0   REFERENCES/FURTHER READING

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UNIT 3   HISTORY OF EDUCATIONAL TECHNOLOGY: GLOBAL PERSPECTIVES

CONTENTS

1.0   INTRODUCTION

In units 1 and 2, attempts were made to explain the meaning of educational technology and instructional technology. In this unit, attention shall be focused on historical development of educational technology. In doing this, you will be taken through the global as well as local emergence of educational technology. You need to acquaint yourself with this aspect of educational technology so as to be reminded of what has happened to the discipline in the past.

By so doing, you will be able to trace the trend of development and that will be good for you. Again, we are warned by Cicero as quoted by Marwick (1974) that "….not to know history of one's past is for one to remain forever a child". Every discipline has its own origin, educational technology is no exception.

2.0   OBJECTIVES

At the end of this unit, you should be able to:

- narrate the history of educational technology globally
- explain the link between technological advancement and the development of educational technology.

3.0   MAIN CONTENT

3.1   History of Educational Technology

The usual practice in an attempt to narrate the history of educational technology is to divide the entire gamut into two. The first aspect is the global and general worldwide historical development, while the second aspect relates to the peculiarity of the historical development at the local level. The first is usually the same all over the globe. Thus, the term – "global history" will discuss the worldwide trends, while variations are noticed in the local aspect of the history. Here, the style of narration will follow the tradition, i.e., the "global" aspect will be treated first while the "local" one will follow later.

3.2   Global   Historical   Development   of   Educational Technology

Stone Age Period

You must have been told the history of the early man at the elementary school. It is the same early man that we are referring to here. You would recall that he was reputed to have lived inside the cave. He was described as a wanderer and that he lived a "crude" life. History had it that he ate his food raw until he was able to discover fire.

SELF-ASSESSMENT EXERCISE 1

Can you suggest the reasons for tracing the origin of educational technology to the early man?

In your answer to activity two, can you reflect that as a wanderer, the early man on a very good day must have covered a very long distance? Covering a long distance implies that he must have encountered series and variety of experiences before hiding his head inside a cave. Though as a stack illiterate, he was able to make some drawings on the surfaces of rocks and other flat objects. Indeed, it could be inferred that some of the drawings would have been generated from his familiarity with his immediate environment. Drawing technology or the art of drawing could then be associated to the early man. Writing technology too was another associated invention credited to the early man. Therefore, if writing and drawing are regarded as essential features of educational technology, then, the early man deserved recognition as the progenitor of the discipline.

The use of stones, pebbles, slates or slabs, counting sticks and bottle caps as is done in most of primary schools are regarded as the replica of

the early man's period. During this period, education was elitist and Aristotelian in nature. Education then was reservation for the rich/elite. It was the period when only few individuals in the society could afford to hire the services of the teachers to teach their sons and daughters in their homes. Typical of this period was the activity of the sophists. The sophists were itinerant teachers who moved from one place to another teaching and collecting money for the service being rendered. At that stage, there was monopoly of knowledge by the "professional" teachers.

3.3   The Age of Book and Chalkboard

In 1456, Johann Guttenberg developed the printing machine with which he was reputed to have printed the first Bible. With this invention, the art of printing spread widely and other books were produced. With information explosion, there was wider spread of awareness and knowledge acquisition. Many people were interested in learning thus it became obvious that "one and one" teacher-pupil interaction as was the situation prior to the invention of the printing machine was no longer workable. This paved way for the assemblage of students at a place for the teacher to attend to simultaneously. The resultant effect of this group communication was the invention of the chalkboard which was popularly known by then as blackboard. The board served as a central point of focus for all the students. It also provided the teacher a place to write down important points, diagrams and symbols. Now, we have different kinds of board in circulation. Mention could be made of wall boards, portable boards, easel board, and magnetic board etc.

3.4   Mass Communication Age

The invention of the radio and the television marked another landmark in the development of educational technology worldwide. Prior to these developments, the scope of educational provision was quite limited and very narrow. However, with the invention of the radio and television, the world entered into the scenario of mass communication and by implication, mass education. The two media became two good sources to reach the unreachable and the less privileged in the society. Indeed, the radio served this purpose better than the television.

SELF-ASSESSMENT EXERCISE 2

Why do you think the radio serves as a mass communication medium than the television?

3.5   The Information Communication Age/Computer Age

The invention of the computer has remarkably changed the educational practice the world over. With computer technology comes the information age. As succinctly put by Akindoju (2002), the computer technology has achieved a wondrous feat unifying all communication media available to man. With the advent of the computer technology come the following developments (Conway, 1990):

a.   Electronic board akin to the white boards with special pens capable to transferring data written on it to the system
b.   Multimedia system equipped with a sound blaster and speakers
c.   CD-ROM player / DVD-ROM player (on which audio, images and video files are recorded)
d.   Video disk player and a videotape player controlled by the personal computer PC)
e.   PC – PC conferencing mode
f.   The touch screen and voice recognition/communication devices for the special education students
g.   The digital camera that combines very well with computer where images can be shown and be manipulated / printed
h.   Advances in virtual reality – virtual libraries, virtual universities, etc.

Computers are now used to package instructions either in a mediated form or in non-mediated form using any or a combination of the styles of drill and practice, tutorials, games, simulations, and/or interactive knowledge-based system.

4.0   CONCLUSION

The history of educational technology is a vital aspect of the discipline. Any serious minded teacher education student is expected to be able to trace the historical development of educational technology at the global level. The history of educational technology is closely linked with the technological trends and the ever-increasing link with the development in the sphere of science and communication technology.

5.0   SUMMARY

In this unit, a lucid historical development in the field of educational technology was presented in four major phases, namely: Early man Era, Era of Chalkboard, Mass Communication and Information Communication Technology.

6.0   TUTOR-MARKED ASSIGNMENT

1.   Trace the global historical development of education technology.
2.   Prove that the history of educational technology is closely linked with the trend of technological development.

7.0   REFERENCES/FURTHER READING

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UNIT 4   HISTORICAL   DEVELOPMENT   OF EDUCATIONAL TECHNOLOGY IN NIGERIA

CONTENTS

1.0   Introduction
2.0   Objectives
3.0   Main Content
      3.1   Origin of Educational Technology in Nigeria
      3.2   Government Support for Educational Technology
      3.3   Foreign Intervention
      3.4   Educational Technology in Nigeria's Higher Institutions
      3.5   The Role of Professional Associations
      3.6   Today's Realities
4.0   Conclusion
5.0   Summary
6.0   Tutor-Marked Assignment
7.0   References/Further Reading

1.0   INTRODUCTION

Having discussed the historical development of educational technology at a global level, it is natural to narrate how the discipline emerged into the educational practice in the country. We shall therefore devote this unit to the study of historical development of educational technology in Nigeria.

2.0   OBJECTIVES

At the end of this unit, you should be able to:

- present in a systematic manner the history of educational technology in Nigeria
- explain the contributions of foreign/international organisations in the application of educational technology in Nigeria
- discuss educational technology as an academic discipline and as a professional field.

3.0 MAIN CONTENT

3.1   Origin of Educational Technology in Nigeria

The origin of the application of educational technology in the Nigerian educational system is not quite clear (Agun and Imogie, 1988). According to the duo, the history of educational technology was not given adequate attention by the chroniclers of educational development in the country.   However, there were reasons that suggested that educational technology has been with us from time immemorial. As succinctly described by Aniemeka (2005), the concept of educational technology has been in practice in this part of the world even before the geographical entity called Nigeria was created.   The author therefore recognised two major periods in the development of educational technology in Nigeria. These are:

(a)   Pre-missionary era
(b)   Era of missionary activities.

 Let us attempt to briefly discus these two periods.

(a)   Pre-missionary Era

This era, as suggested by the name, referred to the period before the advent of the missionaries and the introduction of Qur'anic Schools in Nigeria. For a clearer understanding of this era, you would recall that the Nigerian society had been educating its citizens before the establishment of the school system in what we regard as informal education. During this period, efforts were made by the adult members of the society, family members, etc. to provide opportunities for the newly born child to grow up and acquire the fundamental, basic and necessary knowledge, skills and education that will invariably make him/her a responsible adult who would take good care of him/herself and contribute positively towards the development of the society. This situation was typical of all the various diversified cultural traits of the very many communities in Nigeria.

Specifically, concrete objects like pebbles, sticks, stones, etc. were used to teach the young child to be able to count and solve mathematical problems. The use of symbols in dissemination of information was also an effective strategy. Initiation, regurgitation or role-leaving, acronyms, modeling, etc. were also utilised to ensure effective teaching-learning process. No child was left to develop in isolation, and so, peer-group and teamwork were highly encouraged.

The curriculum though not written was quite extensive and in terms of treatment, intensive. The curriculum covers modern-day subjects like: history, geography, social studies, religious knowledge, sciences, fine arts/crafts, etc. Acquisition of knowledge, skills and the right type of behaviour were the central focus of the curriculum. Efforts were made to making sure that an individual who passed through the curriculum was properly brought up.

Evaluation, both in terms of formative and summative, were applied. Cane was used in situations whereby an individual was considered to be too slow or lackadaisical in his/her attitude towards learning. In terms of methods and materials deployed to effect learning, it could be said that they were inferior, but were nevertheless effective as compared to modern time. The coming of the Christian Missionaries and the Islamic Clerics changed this approach with a "corresponding technology for learning" (Aniemeka, 2005).

(b)   Era of Missionary Activities

The incoming of the missionaries to the Northern and Southern parts of the country marked a watershed in the historical development of educational technology in Nigeria. The Christian missionaries came and realised the need to establish mission schools to enable them achieve a lot in their evangelical mission. In 1842, a school was established in Badagry. Subsequently, prominent missions started establishing schools. In the North however, Qur'anic schools were established. In terms of introduction of aspects of technology, the western education seems to support its integration into the curriculum than the Islamic education.

Noticeable in this era, especially with western education that the Christian missionaries championed were among other things: emphasis on preparation of lesson notes, statement of aims of the lesson, preparation of teaching apparatus, use of teaching aids, chalkboards then known as the blackboards as they usually came in "black" colours, charts, slates, penholders, pencils, ink wells with fountain pens, books, etc.

It should be mentioned that the establishment of teacher training colleges that prepared teachers for the primary school system in particular St. Andrew's Teacher Training College, Oyo and Wesley College, Ibadan among others were a great source of advancement for the entrenchment of educational technology. At these colleges, student teachers were made to see the need for making use of "teaching aids" while teaching. More importantly, the need for the teachers in training to improvise was emphasised. Indeed, there was no hope of passing the Teaching Practice, an important component of training of professional

teachers without making use of instructional materials by student-teacher.

3.2   Government Support for Educational Technology

On its part, in addition to notable moves to improve the quality of education, government took a bold step to launch educational broadcasting first by encouraging instructional radio and later instructional television. The impetus for this development was received from the British Broadcasting Corporation (BBC) with the first educational broadcast in Nigeria in 1953.

The Northern Nigerian Government followed suit when in 1954 it established the School Broadcasting Unit (SBU) in Kaduna. The Western Nigerian Government succeeded in establishing the Western Nigeria Broadcasting Service and symbolically established the first television in Africa in 1959 with the establishment of the Western Nigeria Television (WNTV).

With the intervention of the Federal Government of Nigeria in the early 1960s, the Schools Broadcasting Units had its nomenclature changed to the Educational Radio Service Unit (ERSU) in the first instance, and later to Federal School Broadcast and Audio-Visual Aids Development Centre.

Again, on the basis and need to expand its roles and functions, the ERSU was changed to the National Educational Technology Centre (NETC), Kaduna in 1977. The action of the Federal Government was regarded as "the climax of the direct involvement of the Federal Government in the field of educational broadcasting which began in 1964" (Agun and Imogie, 1988). The NETC was established to perform the following functions:

1.   The development and production of Educational Radio and Television programmes for schools (Primary, Secondary and teacher training colleges)
2.   The development and production of instructional teaching aids for use in schools, using local materials
3.   The training of specialists in the field of educational broadcasting (Radio, Television, Audio-visual aids)
4.   Organisation of seminars/conferences for teachers and teacher trainers on the application of educational technology to class teaching
5.   Provision of consultancy services to the Federal and state governments in the fields of the broadcast media, audio-visual aids and instructional systems technology

6.   Establishment of a National Educational Resource Library of equipment and materials for distribution throughout the country

7.   Documentation and collation of statistical data on the broadcast and audio-visual aids services in the country

8.   Training of educational technologists and cinematographers for services in federal and state government establishments

9.   Assessment, evaluation and classification of imported instructional aids, materials and equipment marketed in the country.

In year 2000, when the National Open University of Nigeria (NOUN) was established, the Centre was ceded to the University as a Campus of the University (NOUN, 2003). In addition to the function of the former NETC, the new role under the NOUN Kaduna Campus shall include the following:

- Production and transmission of instructional programmes on radio and television for learners (students) of the National Open University of Nigeria

- Production of teaching and learning packages, models, audio-visual instructional materials -overhead projector, transparencies, charts, and other non-book instructional support materials for various subjects that can serve the learning environment of the National Open University of Nigeria

- Produce graphics, still photographs, charts and other relevant materials to promote local production of materials in an ODL setting

- Conduct research in the design of multimedia CD-ROM, DVD, VCD (text graphics, audio, video, and animation) for integration into the ODL learning environment provided by the National Open University of Nigeria

- Provide strong support for the future planning, design and development of the e-learning instructional packages and online teaching methodologies for learners in the National Open University of Nigeria

- Aspire to make the campus the world's best regional research and training centre of ODL programmes following the setting up of Regional Training and Research Centre for Distance Learning (RETRIDAL).

3.3   Foreign Intervention

It will amount to an abridged history if the contributions of the foreign bodies and organisations towards the advancement of the cause of educational technology in the country are not given attention. Prominent among these foreign bodies were: United Nations Educational, Scientific and Cultural Organisation (UNESCO), Ford Foundation, British Broadcasting Corporation (BBC), Carnegie Foundation, The Centre for Educational Development Overseas (CEDO) as well as The British Council.

Specifically, the Ford Foundation and the British Broadcasting Corporation assisted the old Nigerian Broadcasting Corporation now Federal Radio Corporation of Nigeria (FRCN) to establish its Schools Unit in 1960 (Agun and Imogie, 1988). UNESCO also played a significant role in the establishment of the audio-visual units at the Colleges of Education at Abraka and Lagos by supporting both institutions, in the needed aids and personnel. With the UNESCO and Carnegie Foundation's support, the University of Ibadan was able to establish the audiovisual aids unit of its Institute of Education in 1962. The unit also benefited from the goodwill of the United Kingdom Ministry for Overseas Development and the Canadian Universities Overseas.

Another aspect of educational technology that enjoyed its entrenchment into the teacher education curriculum in Nigeria is micro-teaching. With the assistance received from the UNESCO and UNDP in terms of equipment and personnel, Alvan Ikoku College of Education, Owerri in Imo State became the home of micro-teaching in Nigeria.

3.4   Educational Technology in Nigeria's Higher Institutions

The contributions of institutions of higher learning in the area of educational technology is worthy of note (Aniemeka, 2005). As at 1970, the Alvan Ikoku College of Education had become popular with micro-teaching using television monitors and videotapes recordings and cameras.

Dearth of experts in some disciplines coupled with increase in students' enrolment for courses-especially the introduction of general studies programmes compelled some universities from the mid-1970s to explore the usage of educational technology media to address the challenges. Thus, in 1974, the University of Ife now Obafemi Awolowo University, Ile-Ife established an audiovisual centre and a closed-circuit television (CCTV).

The University of Lagos established its audio-visual aid centre and later upgraded it to a Centre for Educational Technology. The Ahmadu Bello University (ABU), Zaria equally established an Educational Technology Centre while at the University of Nigeria, Nsukka, a Curriculum and Instructional Materials Centre (CUDIMAC) was established.

With the establishment of Centres for Educational Technology in the nation's first generation universities, it becomes a tradition to find in all the second generation universities and private ones at least a structure in which the traditional as well as modern roles of the Centre for Educational Technology are being performed.

Educational Technology has been a discipline studied at both the undergraduate and postgraduate levels in Nigerian universities. For example, the University of Ilorin started a Bachelor of Education programme with majors in educational technology in the 1980s.

At the Colleges of Education, educational technology and micro-teaching are two courses that students are to take and pass before graduation. All the colleges are mandated to establish centres for educational technology for the purpose of supporting teaching and learning.

Educational technology though relatively new in the country, has produced a number of Nigerian academics with professorial chairs. Among them are Professors: Balogun Taju, Nwabonu Nwaboku, Onyejemezie, Abdullahi, Abolade, A., Agun, I., Akanbi, D.K., Benedict, N Abraham,I, Lade J. Adeyanju and a host of others.

3.5   The Role of Professional Associations

As early as 1964, the association of professionals and practitioners of educational technology, the Northern Nigeria Audio-Visual Association (NNAVA) was formed. In 1965, however, there was the need to further extend the membership of the association to cover the entire length and breadth of the country; thus, it acquired a new name – Nigeria Audio-Visual Association (NAVA). Development in the field necessitated two major changes in the name – NAVA. First, Audio-Visual became a narrow concept to describe what educational technology is. Second, the membership of NAVA did not incorporate all who either specialise in the field or perform tasks that are related to it. As a result of these lapses, the name NAVA was changed to Nigeria Association for Educational Media and Technology (NAEMT) in 1986.

Among other things, the association performs the following functions:

- Promote educational technology at both local and international levels
- Hold annual convention and conference
- Advise government on educational practice
- Organise training, seminar and lectures for schools
- Research into educational practice generally and in particular production, usage, storage and challenges and problems facing educational media.

3.6   Today's Realities

Today, the development of educational technology in Nigeria has assumed a multidimensional form. As the Federal Government is making efforts to integrate technology into the educational system, the institutions of higher learning as well as other levels of education are seriously committed to the same purpose through the various agencies: Universal Basic Education Commission (UBEC), Nigeria Educational Research and Development Council (NERDC), National Universities Commission (NUC), National Commission for Colleges of Education (NCCE), etc.

It is however sad to report that the hope of the achievement of the new initiative in the establishment of a Network of Educational Services Centres in Nigeria (NESCN) will be significantly affected negatively with the loss of the much orchestrated Nigerian Satellite – NIGCOMSAT of recent.

4.0   CONCLUSION

Educational Technology has come of age in Nigeria. It has successfully metamorphosed from an idea to a full-fledged university programme whose functions have been widely acknowledged as essential and highly needed for achieving the purposes for which education is designed for.

5.0   SUMMARY

In this unit, attempts have been made to document the historical development of educational technology in Nigeria. The trend started with the pre-missionary period to the government involvement, foreign partners' activities, the contributions of the higher institutions; and the involvement of professional bodies and contributions of local educational agencies.

6.0   TUTOR-MARKED ASSIGNMENT

Trace in a systematic way, the development of Educational Technology in Nigeria.

7.0   REFERENCES/FURTHER READING

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UNIT 5   THE PLACE OF INFORMATION AND COMMUNICATION TECHNOLOGY IN DISTANCE EDUCATION

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1.0   INTRODUCTION

A modern text on educational technology is expected to devote attention to the treatment of the place of information and communication technologies (ICTs) on distance education. The reason for this is not unconnected with the fact that distance education is gaining the attention of countries all over the world and the propelling force behind its success is directly connected with the use of the different available information communication technologies. It is therefore important for us to consider what distance learning is and the use of communication technology in its operation.

You need be reminded that you are a distant learner who must have been experiencing what it takes to be one rather than a conventional student. Here is an opportunity for you to familiarise yourself with the course and get to know more about the mode through which you are running your programme. Therefore, this attempt should be considered as necessary and should not be seen as an attempt to fill the gap.

2.0   OBJECTIVES

At the end of this unit, you should be able to:

- explain the terms distance education and distance learning
- explain the various ways by which ICT(s) influence teacher education programme
- discuss advantages and disadvantages of some specific media through which instructions in distance learning are disseminated
- make a comparative analysis of how ICT(s) is being utilised in the provision of distance learning in at least two countries.

3.0   MAIN CONTENT

3.1   The Meaning of Distance Education (DE)

Distance education has become the popular term to describe learning via telecommunications. The term telecommunications is used here to embrace a wide variety of media configurations, including radio, telephone and television (broadcast, cable and satellite) {Heinich, Molenva Russell, Smuldina (2002)}. Distance education therefore is used as a general term to describe whatever form of education that is received without the direct presence of the teacher, but usually with the aid of one or a combination of instructional media. According to the University / College library URL: http://wcl.broward.edu/pathropics.htm, distance education / distance learning refers to the teaching-learning arrangement in which the learner and the teacher are separated by geography and time. According to Greenberg (1998), distance education is a planned teaching / learning experience that uses a wide spectrum of technologies to reach learners interactions and certification of learning. Teaster and Blieszer (1999) were of the view that distance education has been applied to many institutional methods; however, its primary distinction is that the teacher and the learner are separated in space and possible time.

The acceptance of distance education as an effective means through which high quality education can be provided has generated a wide range of some terminologies which you may need to know at least a little about. Such terminologies include: open learning, flexible learning, e-learning among others. Don't worry if you are a bit confused, attempt shall be made to differentiate among the three terms.

3.2   Distance Learning

In most literature, both terms – Distance Education and Distance Learning are used synonymously. However, a little distinction can be

made. Distance Learning is any form of studying undertaken through the use of any of the indirect media of imparting knowledge (Ojo, 1986). These media, unlike the direct medium of face-to-face teaching include printed matters, narrowcast, broadcast materials, programmed materials and self-instructional materials.

3.3   Open Learning

Open learning has its root in the philosophy of education as enunciated by many nations of the world especially those nations whose concern for equalisation of educational opportunities is considered paramount. To these countries, all barriers to making all and sundry receive education must be removed. In other words, education must be made available to all irrespective of such factors as gender, race, religion, social and economic status, geography, occupation, age, working or non-working class etc. Therefore, Open Learning is a solution provider in the sense that it is planned deliberately to serve the mass of the people by making it possible for the individual irrespective of their weaknesses to acquire high quality and affordable education.

The idea of opening up access to larger proportion is that access to educational and learning opportunities can no longer be regarded as a matter of philanthropy, charity, benevolence or loftiness of spirit (Faure, 1972.) quoted by Olakulehin and Salawu (2006). According to UNESCO (2002), the term Open and Distance Learning reflects both the fact that all or most of the teaching is conducted by someone removed in time and space from the learner and that the mission aims to include greater dimensions of openness and flexibility whether in terms of access, curriculum or other elements of structure.

A few of the universities all over the world operate with the name Open Universities. The famous United Kingdom Open University (UKOU) is a good example. In Nigeria, we have the National Open University of Nigeria (NOUN). Others include: Indira Ghandi Open University (IGNOU) and Dr. B.R. Ambedkar Open University (BRAOU) in India, University of South Africa (UNISA) to mention just a few.

3.4   Flexible Learning

This term refers to the nature of distance and open education with special reference to its adaptability characteristic. In its approach, it is learner-centred, learner-friendly and learner-committed. Because of this, it attempts to build into its operation some degree of flexibility with the sole purpose of satisfying the aspirations of the learners who are regarded as very special in many respects. Some of the learners are adult members of the community who have perhaps lost hope of

acquiring education, some are working class who may need to go to work and at the same time study and struggle to complete their programmes, some come from educationally disadvantaged areas, some are self-sponsored, some are married while some suffer one kind of setback or the other.

In most open and distance learning institutions, flexibility principles are deliberately built into the system. These are noticed in such aspects like: adoption of multimedia approach to instructional delivery, extension of period of completion of programmes to almost double what operates in conventional system, ease of change of programmes, ease of choice of study centres, far less rigid in terms of choice of attendance at tutorials, provision of such programmes like the Access programmes, etc.

3.5   E-Learning

This term has been variously defined. It is defined as learning using electronic means. It is also regarded as the acquisition of knowledge and skill using electronic technologies such as computer and internet-based courseware and local and wide area networks. It is a new form of teaching device by which students, most especially the distant learners are provided access to the learning materials. E-learning is usually associated with the use of computers but generally, it is a form of instructional delivery which can be provided through any appropriate electronic media such as the mobile phone, television, radio, etc. E-learning is of two major forms. One is called synchronous and the other is called asynchronous. The synchronous form is so-called because of its comprehensive features that allow for interactivity between the learning content and the learners. It has in-built features like the forum chatting, audio-effect. In distance learning, students are separated from the teacher, therefore, synchronous form of e-learning aims at providing multi-outlet opportunities to meaningfully engage the learner and therefore aid comprehension.

Asynchronous form of e-learning on the other hand is the direct opposite of synchronous form. Whereas, the latter by design has multifarious features, the former does not. It only presents the learning content for the students to read, internalise and download if need be. Also, whereas synchronous e-learning allows for immediate feedback as much as possible, asynchronous may not necessarily allow for immediate feedback.

3.6   ICT and Teacher Education in Nigeria

Teacher Education in Nigeria has undergone many changes ranging from its earliest time of predominant use of chalk and talk to the

integration of the new ICT facilities. As of now ICT has been integrated into the planning and classroom teaching in the country. The reasons for the integration of ICT in Teacher Education programme are not far-fetched. Ajayi (2001) opines that the new ICT facilities could allow teachers and lecturers to move into the roles of guides and facilitators assisting students to gain skills required to acquire and utilize knowledge available in various forms all over the world.

Some advantages of infusing ICT into teacher education programme in Nigeria include the following:

- Facilitating an increase in teacher turnover especially in disciplines where there is lack e.g. Mathematics, Sciences, English Language, etc
- Enhancing the quality of teacher education by exposing pre-service and in-service teachers to resources and information beyond their immediate horizon
- Limiting or eliminating the requirement for building large classrooms, laboratories and libraries
- Easy adoption by bodies responsible for teacher education like the National Teachers' Institute (NTI), Colleges of Education, Faculties or Institutes of Education in Universities and School of Education in National Open University of Nigeria
- Enhancing easy handling of large student population and accessibility to information by learners of Open and Distance Education programmes from their headquarters, facilitators and elsewhere
- Simplifying the task of the teacher, lecturer or facilitator while the scope of interaction with materials and men by students is broadened.

3.7   Common Media in Distance Learning

Distance learning is media-driven. It has been established from the various ways by which open distance learning is being run that educational technology has some vital roles to play. The role of educational technology in the operation of Open Distance Learning runs through the spectrum of administration and management of the distance learning institutions to such aspects as instructional delivery, course material design and development, conduct of examinations, learner support services, library, etc.

With this wide range of areas, it becomes obvious to focus our attention to the instructional aspects for now. Therefore, we shall consider the following media as they appeal to open and distance learning. We like

to point your attention to the fact that you should have experienced some of these media in your study.

3.7.1 Broadcast Radio

The radio is a powerful and effective medium through which the audience and in this wise, the distant learners can be reached. Radio can mean two things: radio broadcasting, solely or primarily for direct consumption; or recordings of radio broadcasts to be stored and used in much the same way as audio material, which has been put directly on to cassettes by the producer without the intervention of broadcasting.

Radio broadcasting allows for one-way of passing information across to the audience. However, it allows for some degree of interactivity by using print materials to accompany the programmes and requiring learners to send responses back to the radio teacher. Some programmes provide a telephone number for the students to contact the radio teacher / facilitator. Generally, the following are the major programme formats in radio presentation of instructional content presented by Grundin (1984):

- Lecture or radio talk by an Open University academic or external expert, without accompanying visuals or source materials
- Interview / discussion, e.g. a number of the Open University course team interviewing one or more external experts and discussing various topics with them
- Source material in the form of talk, usually with comments from an Open University academic or expert (such source material could be a sound-recording of historic interest, or a dramatisation, or simply samples of spoken languages to be analysed by the students)

- Radio-vision – That is, a talk illustrated by some kind of visuals e.g. printed diagram and pictures or slides.

Advantages of the Radio in Distance Education

Writing on the advantages of broadcast radio, Heinich, Molenda, Russell, Smaldina (2002) posited that:

- Radio is a less expensive broadcast medium than the television
- It is widely used to solve the problems associated with geographical and economic constraints
- It can reach a large, geographically dispersed population with a single message

- The audio medium is extremely flexible and can have a powerful, dramatic effect, particularly for conveying music, discussion and storytelling
- Radio as an audio medium encourages listeners to use their imaginations to create image. In addition, radio broadcast trains the audience to be good listeners.

Limitations

- Broadcast radio compels students to broadcast time / periods. This is considered a minus for the medium. However, students could record such broadcasts and listen to them at their own convenient time
- In terms of estimating the cost-benefit analysis, it seems rather difficult to justify the expense of operating broadcast facilities when pre-recorded materials are readily available.

3.7.2 Audio Teleconference

The audio teleconference is an extension of a simple telephone call (Heinrich, Michael, James and Sharon, 2002). Audio teleconference allows for individuals or groups of people at two or more locations to hear and be heard clearly and easily.

In order to maximise the use of audio teleconference, an arrangement can be put in place that will enable a live, two-way interactive conversation using the telephone medium. Through this mode of instruction presentation, the facilitator can chat with the learners in separate far remote places in a classroom environment. What will be required is the provision of a speakerphone connection in the classroom. The facilitator needs only a telephone. In case the interaction is planned for two or more groups, as for a class, a special microphone – amplifier device, preferably voice activated is needed at each location. As succinctly put by Heinich *et Al.*, 2002:

- This device assumes that the voices are picked up faithfully and amplified clearly at the listening end. In the middle is a "bridge", an electronic system that joins the calls from all participating locations, equalises the sound levels, filters out extraneous noises, and takes care of disconnections. p. 291

Advantages

There are some attributed advantages to this medium of instructional delivery especially in distance education. Some of them are:

- **Cost effective**: The amount of money needed to organise audio teleconferencing is considered relatively cheaper than some other means of instructional delivery modes
- **Easy to use**: It is considered as one of the most easily accessible form of telecommunications because it uses standard telephone service. Commercial phone companies have made it easy to set up audio teleconferences by any interested distance learning institutions
- **Interactivity**: This form of communication allows for message sharing between and among the participants even though they are in different locations.

Limitations

- **Lack of visual information**: As it were, audio teleconference lacks the advantage of visual dimension to instructional presentations. However, this can be removed by arranging to have concrete materials or graphical representations of the concepts and ideas to be discussed available at the various locations before the broadcasting / conferencing.
- **Poor audio**: There could be problems associated with poor receiving of the message. In other words, information may not be received as intended by the facilitator and also the students, especially if the special microphone amplifier is not provided.
- **Lack of experience**: In a situation whereby students are not used to this form of delivery system, learners may not be able to appreciate its worth and value. Therefore, they may become apprehensive of it. They may also not be willing to participate in it.

3.7.3 Television

The television is another major medium through which distance education can be provided with remarkable effectiveness. The television is yet another powerful mode of instructional delivery with audio and video effects provided together. Through the use of the television, we now have pockets of universities around the world that do provide distance education. The socialist modernisation project made China to establish The Central Radio and Television University (CRTVU) in Beijing in 1978. The university, according to Staff Training and Research Institute of Distance Education (STRIDE, 2000), is at present the largest distance education institute in the world with nearly two million students on its roll. Mention could also be made of another distance education mode in China with strong bias for television. The Shanghai Television University (STVU) which was first opened on April 6, 1960, but was closed down in 1966 during the

Cultural Revolution and reopened in 1978. Other countries where the radio and the television are extensively used for provision of distance education include: Malaysia, Japan, Canada, and United Kingdom etc. It should be noted that the National Open University of Nigeria has, as one of its preferential mode, the use of the television broadcasting to disseminate instructional contents.

Advantages

Television has gained a tremendous acceptance all over the world. Except in few remote parts of the world, it is found in almost every household. For this reason, the television as a means of providing distance learning gives distant learners the advantage of easy access to information. Thus, all learners who wish to benefit from home-study television can do so. Writing on the educational benefits of the television to distance teaching, Bates (1984) provided four major educational benefits as listed below:

- the programmes can carry essential teaching material since all students should be able to access the broadcast
- broadcast programmes publicise the educational opportunities offered by a distance education system, hence boosting recruitment
- the programmes, using the attractive and interesting forms of presentation common to television production, increase motivation and interest in students who are otherwise generally working in isolation; and
- they add to the cultural milieu by offering alternative programming for the general public.

Limitations

There are some major limitations in using the television as a means through which distance education is provided. These include that:

- It may be difficult to obtain transmission lines that are suitable for distance education students.
- Compared to some other media, in particular, the video, the television broadcasting is very weak with regard to student control. Broadcasts, according to Bates (1984), are ephemeral, cannot be reviewed, are uninterruptible; and are presented at the same pace for all students. It is therefore difficult for the students to reflect too much on an item being presented without losing the thread of the programme itself. Thus, unlike the textbooks, a student cannot go over the same material a number of times until it is understood.

- Unless care is taken during the preparation and presentation of the programme, the teacher may not be adequately and functionally integrated. This may be experienced in a situation where production is to be handled mainly by few professional broadcasters;
- Getting an operational licence for the television may be a little bit difficult for institutions of higher learning as it is the case in Nigeria at present.

SELF-ASSESSMENT EXERCISE 1

Mention three other limitations of the television medium in distance education.

3.7.4 Video Tapes

Video tapes are a comparatively recent and evolving medium especially in distance learning. Video tapes are like broadcast television in that they combine moving pictures with sound. But unlike the television, they can be viewed in ways which are independent of pre-determined transmission times.

Advantages of the video tapes in distance learning

The videotapes have some advantages over the television broadcast as means of offering distance learning.

Among the various advantages are:

- Students can watch or view the recorded video lessons when they want and as often as they like
- It allows for flexibility in terms of control. Students can adjust the pace of the learning material to an individually appropriate level. Students can replay sections that move too quickly or by skimming forward over sections that are too slow
- Videotapes / video discs allows for recording of scenes from the regular and instructional television broadcasts for group or individual usage at convenient times. With this feature, the obvious problems of access, control and level which are usually associated to the television broadcasts may be removed.

SELF-ASSESSMENT EXERCISE 2

List and explain five major limitations of the videotapes as a means of providing distance education.

3.7.5 Computer-assisted Learning in Distance Education

The term computer-assisted learning (CAL) is used here in its broadest sense to include all aspects of teaching and learning with computers, but not teaching about computers (Jones, 1984). By extension, such terms like online learning, satellite and e-learning are encompassed in this discussion.

Communication satellites are now a well established part of the telecommunications infrastructure. They are used for communication over long distances particularly where normal terrestrial signal transmission is difficult. Advancement in satellite technology has greatly influenced communication technology just as it has brought a remarkable improvement to television broadcasting and possibility of video and teleconferencing.

The advent of the e-learning – a product of the use of the world-wide-web, satellite and computer technology plus application of education theories has changed the scope, methods and means through which education and in particular, distance education can be provided.

Advantages

- Computer-assisted learning especially through CAL and e-learning can be designed to integrate interactivity feature with the students using the package
- Computer-assisted learning can provide individualised instruction. Thus, a learner can be allowed to go at his/her own rate depending on his/her ability, interest and readiness
- Computer-assisted learning encourages mastery of the content
- Communication satellites make telecommunications almost independent of distance, as it makes little difference whether the destination for the signal is off or on the other side of the ocean.
- Communication satellites reduces the cost of long distance communications as it creates a new democracy of networking with more mutual understanding and cooperation among several stakeholders, service providers as well as service users.

Limitations

- It is not easy to design and produce CAL as well as online interactivity packages
- Learning through CAL and online has not received enough boosts by both the teachers and students in the developed world as to encourage their uses in mass form

- Epileptic nature of electricity supply may hinder effective use of the CAL and online learning
- The cost and maintenance of the computers are regarded as hindrances to the use of CAL and online learning especially in Nigeria where the rate of poverty is still considered as very high.
- The use of CAL and online learning demands acquisition of certain basic skills in the use of computers, where these are lacking among the teachers and the students, they may serve as setback to the adaption / adoption of CAL and online learning.

4.0   CONCLUSION

In this unit, we have been able to define distance education, open learning and e-learning among others. We have also in our discussion provided some media which have direct applications to effective provision of distance education. Attempts were made to highlight both the advantages and limitations of each of the media including radio, television, videotapes and computer-assisted learning such as the e-learning and online packages.

5.0   SUMMARY

The unit has further enriched your knowledge of educational technology as an indisputable discipline that is not only eclectic in nature but has the potentials to effectively shape distance education. In fact, you must have realised that the removal of the term "distance" in distance education relies almost solely on the products of technology which are to be applied through the use of the principles and theories in educational technology.

6.0   TUTOR-MARKED ASSIGNMENT

1.   What roles would you ascribe to educational technology in distance education?
2.   Write short, but comprehensive notes on the advantages and limitations of the following media with particular reference to distance learning:

   a.   Radio
   b.   Television
   c.   Videotapes
   d.   Computers

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UNIT 6   EDUCATIONAL RESOURCE CENTRES (ERC)

CONTENTS

1.0   INTRODUCTION

Several efforts have been made by those who are concerned with the efforts of the teachers to bring about effective teaching and learning.

One of these is the introduction of educational resource centres. You need to acquaint yourself with the rudiments of the benefits derivable from the ERC as well as what are needed to get one established especially in your school of practice.

This unit will provide you with useful information about the meaning, naming, organisation and management of ERCs.

2.0   OBJECTIVES

At the end of this unit, you should be able to:

* explain the term educational resource centres
* provide correct nomenclatures used for educational resource centres at the various levels in Nigeria
* discuss the advantages of educational resource centres
* explain the problems hindering effective operations of educational resource centres in Nigeria.

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3.0 MAIN CONTENT

3.1 Meaning of Educational Resource Centre

Educational Resource Centres are known by many names. They are collectively referred to as media centres, learning centres, audiovisual aids centres, information centres and a host of others. We need not be scared by this development which arose from choice of names and preference for terminologies. It is clear that the philosophy behind the evolution of the centre arose from the much concern for highly rewarding teaching-learning experience. One should therefore point out, at this very beginning, that the choice of the title for this unit is a matter of choice.

Educational Resource Centre, according to Heinich, Molanda, Russell and Smaldino (2002), refers to a self-contained environment designed to promote individual or small group learning around a specific task. An educational resource centre can be described as an environment or a structure that is specifically designed to store, organise and allow for the use of instructional materials by any user for the purpose of bringing about learning.

Thus, according to Adeyanju (2003), the Learning Resource Centre is the laboratory of the educational technologist as well as a place where instructional materials are kept and maintained. Stressing the importance of Educational Resource Centres, Salawu, Afolabi and Taiwo (2001) say they are as important to educational technology as a laboratory is to the teaching of science and what a language laboratory is to the teaching of languages.

3.2 Names of Resource Centres: The Nigerian Experience

What's in a name? You may want to ask. When it became noted that several names, terms are used interchangeably to address the multifarious types of resource centres that have emerged, it got to a stage at which confusion was envisaged. In order to straighten out things, the Joint Consultative Council Reference Committee (JCCRC) on Educational Technology recommended in 1990 certain nomenclature systems for the resource centres in Nigeria.

All the resource centres are separated into two major categories – institutional and governmental.

3.2.1 Institutional Resource Centres: Learning Resource Centre (LRC)

The JCCRC gave recognition to the three tier-educational systems as we have them in the country. These are: primary, secondary and tertiary.

However, in terms of naming the centres, the resource centres established at the primary and secondary schools are to be known and called Learning Resource Centres (LRCs). Those established at the tertiary institutions are to be known and called Centres for Educational Technology (CET).

Functions of the LRCs

They are to:

1. acquire and circulate educational materials.
2. provide professional assistance to teachers and students in the design, production and usage of instructional materials.
3. liaise with State ERC zonal educational offices.

Functions of the Centre for Educational Technology (CETs)

They include:

a. providing a rationalized approach to the acquisition of audio-visual equipment and materials within the institutions
b. building up a pool of basic audio-visual equipment and materials
c. providing campus audio-visual services for academic, administrative staff and students
d. providing professional assistance to the staff and students in the design, production and administration of media materials for improvement of teaching and learning
e. planning and carrying out research activities in the field of educational technology
f. serving as a centre for the adoption, diffusion and dissemination of media related centres and agencies within and outside Nigeria
g. providing training (through workshops, orientations, seminars and lectures in the use of educational media for personnel in the institutions and public schools)
h. coordinating and providing audio-visual services in the lecture theatres / auditoria and classrooms, including public address projection, radio and closed-circuit television systems.

3.2.2 Governmental Resource Centres: Educational Resource Centre (ERC)

The JCCRC gave recognition to the existing three-tier of government: local, state and federal. However, in terms of naming of the resource centres, those at the local and state government levels are to be known and called Educational Resource Centres (ERCs). At the federal level, it is to be known and called National Educational Technology Institute (NETI). It is to be noted that with this name, NETI, there has been an additional responsibility to the former centre which prior to 1990 was named as National Educational Technology Centre (NETC).
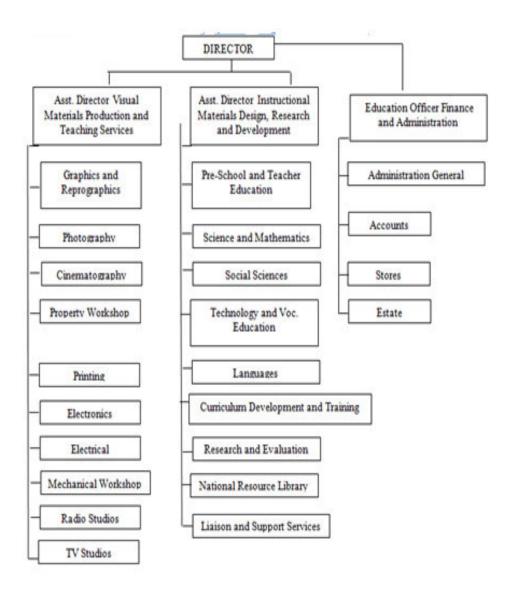
Personnel / Functions and structure of the NETC / NETI
Functions of the National Educational Institute

The Centre performs the following functions:

a.   Planning and organising educational broadcasting
b.   Designing and producing innovational instructional materials
c.   Acquiring and circulating educational equipment and materials
d.   Carrying out research, evaluation and training programmes in educational technology
e.   Liaising with international bodies having similar interest to develop educational technology in the country
f.   Giving financial and technical assistance to ERCs, CETs and LRCs, and
g.   Carrying out any other assignments designed for the upliftment of educational technology in Nigeria.

Responsibilities of the Centre's Personnel

The organisational structure of the National Educational Technology Centre should look like this:

Source: Report of the JCC Reference Committee on Educational Technology, 1990.

Responsibilities of the Centre's Personnel

1.   The Director: S/he is the chief executive of the centre. As the overall boss, s/he is in charge of "Staff development, public relations and consultancy services and formulation of the centre's general policy.

2.   Assistant Director (Instructional Materials Design, Research and Development). S/he is the officer whose duties involve:

      (i)   designing instructional materials in all the school subjects
      (ii)   development of the curriculum
      (iii)   educational broadcasting (radio and television)

(iv)   evaluation of the various educational technology programmes and coordination of research activities in educational technology

(v)   organising workshops, seminars, lectures, exhibitions and in-service training programmes in the centre

(vi)   administering the centre's educational technology library where books and non-book materials and equipment are kept, and retrieved by the library users

(vii)   linking the centre with other centres in the country.

3.   Assistant Director (Visual, Materials Production and Technical Services). The officer performs the following duties. S/he prepares:

(i)   a comprehensive technical plan for establishment of educational technology centres

(ii)   guidelines for the procurement and storage of educational technology equipment materials

(iii)   coordinates installation, operation and maintenance of educational technology equipment as well as provision of technical services during the production and transmission of educational programmes

(iv)   s/he is in charge of the following units – photography, graphics, cinematography and printing of the centre.

4.   Chief Education Officer (Administration). S/he performs dual roles, which include:

a.   Administration matters:
(i)   Transport control
(ii)   Secretarial services
(iii)   Purchasing and storage
(iv)   Supply

b.   Accounts:
(i)   The various sections of the centre are headed by sectional heads that are directly responsible to their respective Assistant Directors. Apart from preparing their sectional schedule of duty, they equally supervise the activities of other staff under their care.

3.3   Models / Forms of Resource Centres

3.3.1 Classroom Learning Centres (CLC)

I could recall my experience as a primary school pupil in a typical village school. Don't ask me where and when? My class teacher and indeed, all class teachers made provision for what was then known and called "Nature Corner". No matter how small a class was in terms of space availability, it was a tradition that "Nature Corner" must be created.

The "Nature Corner" was a place (corner) with one or at most two reading/writing tables where items of nature like cowries, birds' feathers, snail shells, specimen of bones, etc. were kept, labeled and made use of during teaching while they served as tourist attraction for learners as they appreciate them during break time.

The concept of classroom resource corners is a reflection of the past experience discussed above. A cursory observation of classroom environment nowadays, especially in public schools (primary and secondary) reveals that a number of classes lack resources from which learners can naturally learn without the efforts of the teacher. The resources encourage learning. Therefore, with a rich display of sourced instructional resources that are usually not natural, man-made resources placed within the classroom environment provide a learning environment for the learners.

3.3.2 Community Learning Resource Centres

You may be wondering why you are being bothered to learn something about Community Learning Resources Centres. The reasons are not far-fetched. As a teacher, you are expected to be resourceful. In specific terms, you are expected to make use of the human, material, natural and man-made resources that abound within your immediate environment. I am sure you are aware of the fact that there is no environment, whether rural or urban that is not endowed with some resources. You are to tap these resources for the purpose of effecting effective teaching and learning process.

Generally speaking, instructional resources could be categorised into:

(i)   instructional resources by design, and
(ii)   instructional resources by utilisation.

Those instructional resources that are naturally designed, produced and available for usage in the classroom teaching and learning situations fall under the first classification.

Instructional resources that are not intentionally produced for classroom usage, but could be used by the teacher in his/her efforts at imparting knowledge are classified as those by utilisation.

SELF-ASSESSMENT EXERCISE 1

Which of the two classifications fits into the concept of community resources?

If your answer is instructional resources by utilisation, then, you are correct. This is because most of the resources within the immediate environment are not designed for instructional purposes at the school system. You can imagine taking your students out on a fieldtrip to the nearest bakery, carpentry, woodwork, mechanic or welding workshops; a nearby river, valley or mountain, zoological or botanical garden, a university, etc. Students are expected to learn maximally from the live and direct experience they come in contact with. Similarly, when professionals within the community, like nurses, doctors, or others like carpenters, mechanics, block makers, artists, etc. are invited to give a talk to the students in their various areas of specialty, it affords the students the opportunity to learn directly with ease.

Another manner of utilising community resources is for the teacher to make use of materials produced by government agencies and non-governmental organisations for the dissemination of information to students. I am sure you are aware that most of government ministries and parastatals produce graphic materials in the form of posters, calendars, year books, films, compact-discs (CDs), audiotapes, etc. These materials are good instructional resources for teachers with high ingenuity and resourcefulness. You can therefore see reasons why teachers are encouraged to utilise resources within their reach.

SELF-ASSESSMENT EXERCISE 2

State four reasons why teachers should make use of community resources.

Compare your response in the self test exercise to the points provided below as justification for utilisation of available resources in a community by the teachers:

(i)   They are readily available
(ii)   They provide direct and purposeful experience to students
(iii) They ease the task of the teachers who do not need to stress him/herself in the process of providing explanation/discussion since the material(s) or issues of interest are right there for the students to see, feel, taste or hear
(iv)   Community resources are relatively cheaper than teacher-made
(v)   School-community relationship is better fostered
(vi)   Through fieldtrip/excursion, students are made to learn while socialisation is fostered among the students.

Hints on Utilising Community Resources

- If it involves inviting human resource persons to school, there is a need for adequate planning
- Direct the attention of the resource person(s) to the aspect s/he should cover in his talk/speech
- Prepare the class ahead of the interaction
- Allow for pupils' opinions/questions
- Round up the lesson by providing a rich summary
- Vote of thanks should be given
- Letter/visit of appreciation should follow.

However, if the community resources are non-human, the teacher must ensure that the resources are:

- relevant to the topic it is being deployed for
- relevant to the objectives set for the lesson
- compensate for the efforts made to secure it
- cost effective
- guarantee high quality
- easy to use
- free of complexity of content.

3.4 Management and Maintenance Educational Resource Centres (ERC)

Management simply means effective integration and utilisation of man, material and money resources to achieve the goals of a resource centre. Care must be taken to adequately plan the physical layout of the centre, adopt a clear-cut administrative pattern, source for skilled personnel, relevant equipment and material, etc.

Physical Plant Requirement

The activities that are carried out in a resources centre are many and diverse. It is therefore necessary to operate in a space that provides basic comfort for staff and users of the centre. In other words, there should be adequate space for work where traffic is restricted and aesthetically appreciable. The structure to be used should be well-planned and constructed in such a way that activities in one space should not interfere with those in other space areas. It is considered that large structures are not necessarily needed, but should be adequate
 to achieve maximum effect by users of the resources.

Administrative Pattern

There are four administrative patterns for the management of resource centres as Brown *et al.* (1972) put it. They are:

(i)   complete decentralisation
(ii)   centralisation of library material and services only
(iii)   centralisation of separate library and audiovisual services
(iv)   centralisation of media centre services.

(i)   Complete Decentralisation

Under this management, there are no central resources and no specialised personnel. Here, the intending users of resource materials go out to search and obtain what they need. Spires (1974) described this pattern of resource centre administration as "go and find out yourself if you think it is a worthwhile" approach. There is no gainsaying that any administrative pattern where nobody is particularly in charge will not facilitate the achievement of the goals for which that establishment was set up.

(ii)   Centralisation of Library Material and Services only

This concerns the concentration of print materials (texts) in a centre usually referred to as library. A professionally trained librarian is put in charge to administer the print resources.

(iii)   Centralisation of Separate Library and Audiovisual Services

Under this arrangement, print resources and audiovisual resources are collected under one roof. There are professionally trained librarian and audiovisual media personnel to handle the resources respectively. In most cases, the audiovisual media personnel function on part-time basis.

(iv)   Centralisation of Media Centre Services

Under this arrangement, there is an integrated print and audiovisuals or non-text facilities and resource. The emphasis here is on the application of instructional technology and systematic, insightful uses of materials as basic, supplementary element of instruction (Spires, 1974). The centre personnel are usually media specialists and professionals who are trained in the area of media utilisation and management of a full range of instructional media. We shall now discuss media personnel because the resource centre services are facilitated by human beings.

Media Personnel

Well trained personnel and other professionals are needed for the smooth running of a media resources centre. There are four categories of media personnel required in a centre:

(i)   Media specialist
(ii)   Media professionals
(iii)   Media aides
(iv)   Media

(i)   **Media Specialist**

The media specialist is the overall head of the centre. He is in charge of the day-to-day management of the centre's resources. He is experienced in curriculum development. Usually, he is designated the director of the centre and may hold a postgraduate qualification in educational technology. Therefore, he is qualified by training and by experience.

His function in the centre includes:

a.   seeing to the maintenance and repair of all the resources in the centre
b.   helping in curriculum design and development
c.   drawing up the budget of the centre, organising workshops, seminars and conferences, providing training in developing and implementing media utilisation policies of the centre
d.   providing training opportunities for teachers and members of the community in the designing and use of learning materials
e.   evaluating staff performance and recommending them for promotion.

(ii)   Media Professionals

Media professionals are personnel of the resources centre that take charge of routine maintenance and repair of the centre's equipment and facilities.   They include the technician, the photographer, the projectionists, etc. These usually are qualified by experience but not by certification.

(iii)   Media Aides

These are officers of the centre whose functions are mainly supportive of the activities of the centre. They include the storekeeper, clerks, confidential secretary, typist, gardener, office assistants, the driver, etc.

(iv)   Media

Media Acquisition

There are four major modes for acquiring instructional resources, namely: purchasing, borrowing, sharing and production (Beswick, 1978).

Usually, most resource centres go for outright purchase of resource materials that the centre needs. But the harsh economic condition is beginning to make managers of centres to think of alternative ways of making resources available to users.

In the event of non-availability of the required instructional materials, the resources centre's manager or director can establish contact with other sister institutions to borrow what is required. An establishment of relationship with more than one sister instructional resource centre creates a network of resource centres which will ensure constant supply of materials needed by a member of that network at any given time.

Production of instructional materials by teachers and students should be encouraged as a way of acquiring and stocking the centre with needed resource materials. Though such materials may have crude finishing, they would be more appropriate for instructional purpose because they are products of appropriate technology. This means that they are cheap and need-serving. It is reported that some teachers develop phobia when confronted with the use of sophisticated technology product. Beswick (1975) reported that:

- Successful centres in Great Britain were those which began by offering services directly related to the day-to-day problems of teachers… teachers sometimes withdraw in alarm from centres

whose gleaming hard-wares bore little immediate relation to their own problems as they saw them.

The major advantage of using local instructional resource is that the objective for which the materials are made is the makers own so that the users characteristics are known and considered along, while designing and developing the materials.

Criteria for Acquiring Instructional Resources

There are some criteria that should be considered before instructional resources are acquired by a resources centre:

1. **Content of materials:** The content of the material must be relevant to the need of the centre and the benefiting community. It should be up-to-date and accurate. For example, if it is a text, the content must reflect present day realities.
2. **The Purpose:** The purpose for developing such material should meet the purpose for which it is being acquired.
3. **Appropriateness:** Are the materials appropriate? Are they easy to handle? Are they relevant to client characteristics? Are they sophisticated to the extent that users will have to undergo specific training before they could use them? Are they suitable for various audience sizes? These are pertinent questions that need to be answered before deciding to acquire such materials.
4. **Cost:** To acquire materials, the centre's director must ensure that all material acquired have cost benefit. For example, is it appropriate to buy a multimedia projector or a video projector? Which is more relevant to the users? Will the budget of the centre not be adversely affected? Can the centre afford the cost at the expense of the material? Can the centre afford to maintain the department in case of any damage to it?
5. **Technical Quality:** There are various types of equipment and materials in the market with varying qualities. In the recent past, Japanese products were more favoured because of their relatively high technical qualities, ease of maintenance and repair and cheaper cost over some European products. Today, although various Japanese products are still recognised for their high technical qualities, products from different sources of manufacture are available in the market and are competing most effectively with Japanese products.

The onus is, however, on the centre's director or manager to decide on what product or acquire based on known criteria and priorities of the users.

4.0   CONCLUSION

We have been able to see that just as individuals bear different names so do media centres. The Media Centre at the national level is known and called National Technology Institute. Those at the State are to be properly addressed as Educational Resource Centre. At the primary level and secondary levels, they are called learning resource centres while the ones at the tertiary institutions are called Centre for Educational Technology (CET).

5.0   SUMMARY

In this unit, we have studied the various names and functions of the media centres. The various media centres if well utilised would assist both the teachers and students in bringing about effective teaching and learning. You begin to wonder why teachers are not making use of the opportunities that the existing resource centres can provide. A visit to your state Education Resource Centre (ERC) would convince you more about the good intention of the government to ensuring effective teaching and learning. You are therefore encouraged to make the best use of the knowledge provided in this Unit to avoid the usual excuses of non utilisation of instructional materials as a result of cost, non-availability, technical skills and a host of others.

6.0   TUTOR-MARKED ASSIGNMENT

The roles of the Educational Technology Centre and the National Educational Technology Institute are the same. Do you agree?

7.0   REFERENCES/FURTHER READING

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MODULE 2   INSTRUCTIONAL   COMMUNICATION SYSTEMS AND DEVELOPMENT

Unit 1   The Communication Process
Unit 2   Types and Models of Communication
Unit 3   Instructional Systems Design: Definition of Terms
Unit 4   Systems Approach
Unit 5   Factors or Methods, Media Selection, Time and Evaluation in Instructional Systems Design and Development

UNIT 1   THE COMMUNICATION PROCESS

CONTENTS

1.0   Introduction
2.0   Objectives
3.0   Main Content
        3.1   The Meaning / Definition of Communication
        3.2   Communication Process
                3.2.1 Sender
                3.2.2 Decoder
                3.2.3 The Message
                3.2.4 The Channel
                3.2.5 The Noise
                3.2.6 Feedback
4.0   Conclusion
5.0   Summary
6.0   Tutor-Marked Assignment
7.0   References/Further Reading

1.0   INTRODUCTION

Communication is essential for the existence of societies, whether they are developed or developing. It is necessary for your accumulation of knowledge and capability. Furthermore, it serves as an instrument of social interaction. For the desirable change in learners' behaviour and acquisition of knowledge and skills to be accomplished, communication must both take place between the teachers and learners. It is important for teachers to have deep knowledge of what communication process is and also be skillful in the use of communication skills. This unit is devoted to the study of communication process for you to be able to acquaint yourself with how you can improve your communication as an individual and more importantly as a teacher.

2.0   OBJECTIVES

At the end of this unit, you should be able to:

- define the term communication
- explain the concept "communication process"
- identify and describe, at least, six elements in communication process
- establish the relationship between communication process and teaching-learning process
- identify and discuss various factors that could constitute communication noise in a typical classroom teaching-learning process.

3.0   MAIN CONTENT

3.1   The Meaning / Definition of Communication

Communication is a universal and everyday occurrence, and therefore, it is a concept that has generated a lot of interest on the part of researchers, governments and organisations. The universal nature of communication has led to countless definitions of the term (Sybil, Oche and Oludayo, 1990). Some of these definitions, according to them, are:

1. Communication is any means by which a thought is transferred from one person to another (Chappell, R. and Read, W.L. 5th ed., 1984)
2. Communication is the process by which one person (or a group) shares and imparts information to another person (or group) so that both people (or group) clearly understood one another (Udall, R. and Udall, S., 1979)
3. Communication is not just the giving of information, it is the giving of understandable information and receiving and understanding the message. . .It is the transferring of a message to another party so that it can be understood and acted upon (E.C. Eyre, 1983)
4. Communication is an exchange of ideas, thought or knowledge between at least two people with an intention of changing the behaviour of one another particularly the decoder (Abimbade, 1997).

In terms of classroom usage, the term communication can be defined as the totality of the teacher's efforts to ensure that all the stated instructional objectives are accomplished through effective manipulation of the task, method(s), media, learners as well as the entire teaching-learning environment.
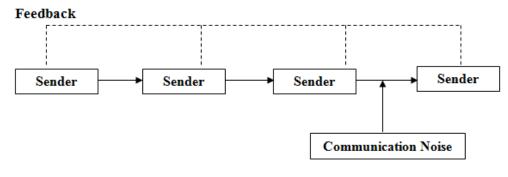
SELF-ASSESSMENT EXERCISE 1

Write down what you consider as your own definition of communication.

3.2   Communication Process

By its nature, communication involves an exchange of ideas or information with at least two people. By so doing, many variables are involved, and therefore account for communication being regarded as cyclical rather than being linear. The interchange of the variables makes the interaction to be regarded as a process. Thus, the process of communication always involves the sender, the message/information, the medium/media and the receiver. According to Berlo (1960), the ingredients of communication process include: the source, the message, the receiver, the channel or medium. Bardell (1978) referred to the sender and the receiver as the "encoder" and the "decoder" respectively.

As a process involving many interrelated parts, all the parts are expected to work harmoniously for the purpose of communication to be achieved. It is important to note that if there is a problem why any of the elements/ingredients of communication process, communication will be impaired thereby resulting to either partial or complete communication breakdown.

The communication process may be illustrated in a simple form this way:

Feedback

| Sender | → | Sender | → | Sender | → | Sender |

Communication Noise

Source: Salawu, I.O. and Afolabi, A.O. (2001) – Introduction to Educational Technology. Ojo K:Blessings Publishers, p. 18

3.2.1   Sender

This is a technical term that refers to the person who initiates the exchange of idea / information. S/he is responsible for what is to be disseminated, how it should be done, where and how it should be assessed. The sender plays a prominent role in communication process. If the sender is to be successful in conveying his message, s/he must, according to Lazarus (1981):

- know the receiver and present the information at his/her level
- speak or write clearly and concisely
- convey the desire to reach the receiver by his attitude, and
- obtain feedback to confirm that the message has been received correctly.

To achieve the above four points, the sender must take into account the language proficiency, cognitive ability, social status, aspirations, learning styles, psychological situation as well as the family structure of the receiver. The sender must always use the basic skills in speaking and writing interpreted as the "KISS" principle – Keep It Short and Simple. Lazarus (1981) was of the opinion that "Brevity and simplicity may not win forensic honours but they warrant paramount consideration in effective communication." Simplicity and brevity are therefore antidotes to misunderstanding and ambiguity.

Furthermore, a sender has to be mindful of his attitude to the receiver during presentation. Attitude of the sender to the receiver must be warm and friendly. Saul (1968) said that "communication depends on the attitude of the sender towards the receiver". An attitude of understanding by the sender can serve as a motivating factor to the receiver. In addition, the sender is expected to consider selecting appropriate medium/channel of communication. When wrong channel of communication is used, communication will be impaired.

It is also expected of the sender to be sure that the communication process is effective. A way by which this could be done is for the sender to engage himself in periodic assessment of the receiver's gains during communication process. The adoption of the formative evaluation procedure will provide him/her the needed feedback on the receiver's performance. Where expected outcomes are discovered as accomplished, necessary steps are taken to encourage further practice and retention. However, where the expected outcomes are lacking, immediate steps must be taken to "fine-tune" the communication process. This is necessary because without the purpose of communication being achieved, the sender's efforts are regarded as nullity and of no effect.

To find out whether the communication process is effective or not, feedback can be sought by using such approaches as:

- questioning the receiver on specific points during presentation
- careful observation of the receiver's facial expressions and manner
- solicit suggestions, or explanations, or examples from the receiver
- in general, make your receiver(s) active during communication.

3.2.2   Decoder

The decoder is the receiver of the message. He is referred to as the decoder, communicattee, as well as the audience. The decoder therefore refers to the person for which the message is designed. The extent to which communication process is effective can be determined by the degree of changes noticeable in the decoder.

For effective communication to take place, the decoder should be:

- a good listener for him/her to get correct information from the sender/encoder
- psychologically ready in that he should be in right frame of mind. Nothing should preoccupy his mind other than what the sender is imparting to him
- ready for the task in terms of maturity as well as determination to learn
- able to follow instructions and take active part in the communication process.

3.2.3 Message

This refers to the information, the task, the content, the subject matter, knowledge, attitude, values, beliefs and/or skills designed and planned to be acquired by the decoder. The message has to be correct and adequate.

3.2.4 The Channel

Anything that relays the message to the receiver is a channel. Another term commonly used for channel is "the medium". A general interpretation of means through which information is packaged and disseminated as a combination of channels and medium will not only be limited to, oral, written, and non-verbal, but also such media like: the radio, television, overhead projector, films, etc.

3.2.5 Noise

Sybil, Oche and Soola (1990??) refer to noise in communication as "a technical term for all forms of obstacles which conspire to reduce the fidelity of communication". It then implies that what makes it impossible for the decoder to get the message as intended by the encoder constitute communication noise. Noise can be physical/environmental, physiological and psychological.

Physical/Environmental Noise

Any form of disturbances to communication process traceable to the factors within the immediate physical environment is classified as physical/environmental noise. Continuous or intermittent loud sounds from radio sets, markets, grinding machines, block making machines, hooting by moving vehicles, and outcry from the next class, sound from technical workshops, etc. are examples of physical/environmental noise.

Physiological Noise

Any form of disturbances to the communication process arising from ill-health on the part of the sender and/or the receiver is referred to as physiological noise. Cases of headache, stomach disorder, body pains, etc. during communication process are examples of physiological noise.

Psychological Noise

This refers to unfavourable state of the mind of the sender and/or the receiver. Psychological noise includes fatigue, emotional depression, annoyance and lack of enthusiasm arising from internally or externally related problems.

Other sources of communication noise especially on the part of the sender include:

- poor preparation
- lack of deep knowledge of the message/topic under discussion
- usage of wrong media
- exhibition of disturbing mannerisms
- inadequate mastery/usage of language of communication
- insensitivity to the receiver and a host of others.

SELF-ASSESSMENT EXERCISE 2

Write down two factors each for the different categories of communication noise.

3.2.6 Feedback

This is a technical term which refers to the available facts collected to determine the effectiveness or otherwise of the interaction between the sender and the receiver during communication process. The feedback provides opportunities for the sender to readdress, in whole or in part, deficiencies during the course of communication. Close to feedback is assessment. Feedback is necessary in communication because without it, decisions on whether communication is effective or not cannot be determined.

4.0 CONCLUSION

Communication is basic to life; its role in human society is underscored in the fact that no meaningful development can take place without it. Teaching requires sound knowledge of communication process by the teachers. Therefore, as student teachers in training, you will be required, once more, to acquaint yourself with the details of what you have learned in this unit and the subsequent ones on communication process.

5.0 SUMMARY

We have so far explained the meaning of communication process. We have seen that there are six essential parts of any communication process – the sender / encoder, the message / information / content / subject matter, the channel / medium / the noise factor, the receiver / decoder and the feedback.

6.0 TUTOR-MARKED ASSIGNMENT

Fill in the blank spaces with suitable terms:

1.   Another term for sender is …………..
2.   …………… is the interpreter of the message.
3.   During communication process, the …………. and the …………
        change roles as situation demands.
4.   Hindrances to communication process are called ………….
5.   Hindrances to communication can be ……………, ……………
        and …………..
6.   …………… provides opportunity for assessing effectiveness or
        otherwise of communication process.

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UNIT 2   TYPES AND MODELS OF COMMUNICATION

CONTENTS

1.0   INTRODUCTION

The interest generally in the study of communication process has provided us with a number of models of communication. It is interesting to note that each model presents a mental picture of what each provider considers as ways by which communication flows. In this unit, attempts shall be made to intimate you with some of the popular models found in literature that have direct implications for teaching and learning process.

2.0   OBJECTIVES

By the end of this unit, you should be able to:

- list and discuss the various types of communication
- sketch and explain David Berlo's, Schramm and Weaver, and Harold Lasswel Communication models.

3.0   MAIN CONTENT

3.1   Types of Communication

You would recall that communication is described as sending and receiving of information. The process of sending and receiving information includes consideration of the intended message/content, making a choice of medium/media to be used; consideration of the methods to be adopted, and elimination of blockages to the message, evaluation and provision of feedback.

Generally speaking, there are two types of communication. They are oral and written. Oral communication is used in intrapersonal, interpersonal, small group and mass communication. We shall learn each of the types for better understanding.

3.1.1 Intrapersonal Communication

This type of communication involves only one person. Communication process is non interactive as it involves an individual talking to himself in a manner that may be internalised or externalised. When an individual externalises his thought, his ideas or feelings are expressed aloud by talking. This is considered as abnormal.

3.1.2 Interpersonal Communication

This is a form of communication in which two people are involved. It is often referred to as "face-to-face communication". It is not when such medium like the telephone is used, but two people are still involved.

Interpersonal communication encourages exchange of idea/information in the form of dialogue and or a discussion. Since only two people are involved in interpersonal communication, it is usually regarded as an effective form of communication in that immediate response from both the sender and the receiver is facilitated.

3.1.3 Small Group Communication

This is a form of communication in which three or more people are involved. Small group communication therefore refers to the exchange of ideas/information among members of a group.

Typical of a group is a normal class size of 30 pupils or a little above. Members of the group are expected to work together as a team to achieve the common objectives.

3.1.4 Public Communication

This is a form of communication in which the speaker addresses a larger audience compared with the small group communication. Typical of public communication are organised political or religious rally.

3.1.5 Mass Communication

This refers to a situation whereby so many people are target audience of the speaker. As a result of the population of the audience, the speaker may resort to using such mass media like the radio and the television to reach out to them in different locations simultaneously. Other mass media include: the newspapers, magazines, sound film and the internet.
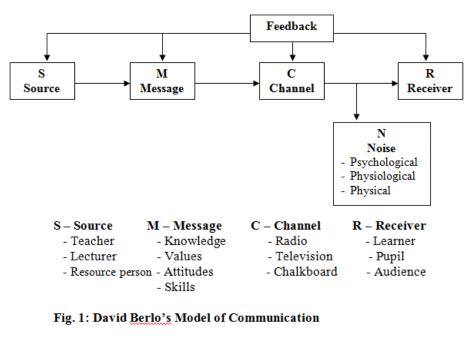
3.1.6 Written Communication

This refers to the translation of oral messages into the alphabetic symbols to convey meaningful ideas, messages or information. Our emphasis here is on the use of oral communication.

3.2   Communication Models

There are different models of communication. Among them are those of David Berlo, Shannon & Weaver, Harold Lasswell and the Close loop models.

3.2.1 David Berlo's S.M.C.R. Communication Model

S.M.C.R. Communication model was originated by David Berlo. The model is presented in the Figure 1:

S – Source   **M – Message**   **C – Channel**   **R – Receiver**
  - Teacher   - Knowledge   - Radio   - Learner
  - Lecturer   - Values   - Television   - Pupil
  - Resource person - Attitudes   - Chalkboard   - Audience
                     - Skills

Fig. 1: David Berlo's Model of Communication

Source: Abimbade, A. (1997). Principles and Practice of Educational Technology, pg. 35.

3.2.2 Harold Lasswell's Communication Model

This model is almost a replica of David Berlo's communication model. However, the ingenuity of the originator is found in his ability to shift the task of identifying the elements of communication by providing answers to the questions asked. The association between the two models lies in the fact that answers to the Harold Lasswell's communication model are provided in David Berlo's model. A sketch of Harold Lasswell's communication model has been provided for you in the Figure 2:
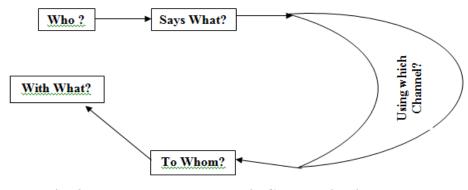

Fig. 2:   Harold Lasswell's Communication Model
Source: Aiyelagbe, G.O. (1999): Basic Processes in Education (Ed) Ogunsanya, M., p. 121.

SELF-ASSESSMENT EXERCISE

Find answers to the five (5) questions asked in Harold Lasswell Communication Model in David Berlo's Communication Model.

3.2.3 Shannon and Weaver Communication Model

This model of communication depicts graphical representation of electronic communication process especially when such media like the radio and the television are involved. The model emerged from an attempt by Shannon, C.E. and Weaver, W. to explain the mathematical theory of communication (see Fig. 3).
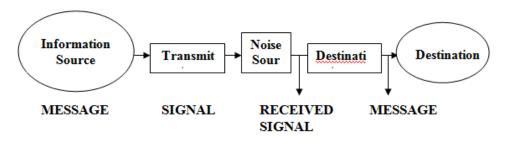

MESSAGE   **SIGNAL**   **RECEIVED SIGNAL**   **MESSAGE**

Fig. 3: Shannon, C.E. and Weaver, W. Communication Model

Source: Salawu, I.O., Taiwo, S.A. and Aremu, G.B. (1994): An Introduction to Educational Technology, Ibadan, Afolabi Press Limited, pg. 19.

3.2.4 Closed Loop Communication Model

The outcomes of interactivity in any communication process leads to the formulation of the close loop communication model. The model is like any of the earlier ones discussed. However, the major area of difference is in the recognition of exchange of roles by the various elements of communication according to the dictates of the prevailing situation. An example of the diagram is presented in the figure 4.
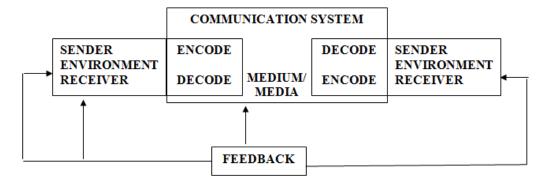
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                    ┌──────────────────────────────┐
                    │   COMMUNICATION SYSTEM        │
          ┌─────────┼──────────┬──────────┬─────────┼──────────┐
          │ SENDER  │ ENCODE   │          │ DECODE   │ SENDER   │
          │ENVIRON- │          │ MEDIUM/  │          │ENVIRON-  │
          │ MENT    │──────────│ MEDIA    │──────────│ MENT     │
          │RECEIVER │ DECODE   │          │ ENCODE   │RECEIVER  │
          └─────────┴──────────┴──────────┴──────────┴──────────┘
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Fig. 4: Close Loop Communication Model

Source: Salawu, I.O., Taiwo, A., and Aremu, G.B. (1994) – An Introduction to Educational Technology, Afolabi Press Limited, p. 20.

3.3 Implication of Communication Models for Teaching/Learning Process

You may be wondering why you have to study communication models in this course. In other words, you must have been concerned about what relationship does your job (effecting teaching and learning) has to do with communication models. Answers to these pertinent questions shall be provided right now. Just as you must have learnt that the common elements of communication process presented in each of all the models are the sender, receiver, message, channel/medium, noise and feedback, so also are all these elements found in a classroom communication process.

SELF-ASSESSMENT EXERCISE 2

Look for a semblance of each of the model's components of communication in a teaching – learning process. Compare your answers with that of your study group members.

Common components of teaching – learning system include the teacher (sender/receiver), the message (topic/content/subject matter), the channel (audio, visual, audiovisual, projected and non-projected realia, models, etc), noise (physical, psychological and/or environmental), learners (receiver/sender), evaluation (formative and summative), methods and feedback. All these elements as depicted in the models of communication must work together to achieve the predetermined objectives.

The teacher must organise the teaching – learning process in such a manner that will make the learners very active. Appropriate channel must be selected while the classroom environment must also be made conducive so that effective teaching and learning would take place.

Teaching that is aimed at producing quality learning must be systematically presented. To do this, there must be adequate provision for evaluation. Getting regular feedback on learners' acquisition of the task will assist you, but communication noise must be reduced to the barest minimum so that learning on the part of the learners will not be impaired.

There must be an established common knowledge boundary (field of experience) between the teacher and the learners. The diagram in the Figure 5 explains this fact.
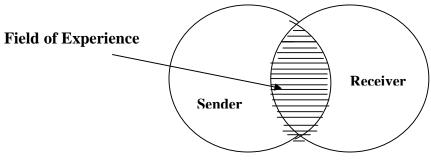
Field of Experience

Sender   **Receiver**

Fig. 5:   Common Knowledge Boundary

It is important to carefully make the choice of medium/media, the language of presentation as well as choice of words and structures so that teaching will be learner-driven.

4.0   CONCLUSION

Communication process is a cyclical rather than linear process and each element of communication is as important as the other. This is why adequate attention should be given when planning and executing communication process.

In any communication process, interactivity among the various elements is very important. You are advised to watch out so that your class will not suffer boredom.

5.0   SUMMARY

In this unit, attempts were made to highlight the different types of communication and models with emphasis on the oral aspect.

Four models of communication process were identified and were extensively discussed. Attention was focused on the implications of the knowledge of communication model to teaching – learning situation.

6.0   TUTOR-MARKED ASSIGNMENT

You are to use any communication model to establish the similarities between the selected model and the teaching – learning process.

7.0   REFERENCES/FURTHER READING

Abimbade, A. (1997). *Principles and Practice of Educational Technology*. Ibadan: International Publishers Limited, pg. 35.

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UNIT 3   INSTRUCTIONAL   SYSTEMS   DESIGN: DEFINITION OF TERMS

CONTENTS

1.0   INTRODUCTION

One of the good qualities of a teacher is to design and develop instructional system. However, instructional system design and development are a little complex and could be tasking if you do not learn it well. It requires that the designer and implementer have deep knowledge of what instruction is, what a system is as well as ability to organise the different composite aspects of the instructional systems. We shall concentrate our attention here on discussion of some common terms to facilitate your understanding of the task at hand.

2.0   OBJECTIVES

By the end of this unit, you should be able to:

- define the terms instruction, system development, instructional system and instructional system development
- describe different approaches to instructional system design
- identify and discuss the basic factors in instructional system design and development.

3.0   MAIN CONTENT

3.1   The term "Instruction"

Instruction is a subset of education and it is a key element in any discussion on instructional system (Imogie, 1988). One of the major attributes of instruction is systematic planning and management of all elements in a manner that maximises opportunities for learning to take place. According to Lumsdaine (1964), instruction refers to "any specifiable means of controlling or manipulating a sequence of events to produce the required modification of behaviour through learning."

3.2   A System – Definition

A system, according to Balogun and Abimbade (1999), is defined as "a collection of elements, parts or components which work together cooperatively with the purpose of achieving predetermined goals." Similarly, a system can be defined as a sum total of separate parts, units, or departments working independently and at the same time jointly to achieve predetermined objectives.

There are several types of systems. Mention could be made of natural (human beings, solar energy, water system, law system, etc), man-made system (political system, educational system, economic system, vehicular system etc), simple versus complex system, closed versus open system, and a host of others.

You may ask, what are the major characteristics of a system? Every system, whether simple or complex, material or artificial are built around elements, parts or components with a purpose product, process and content (Balogun and Abimbade, 1999).

A system is usually considered as a relative term especially in its classification. A system classified as a supra-system in a given situation can be described as a subsystem in another given situation. Nigeria, for example, is considered a supra system comprising 36 states with each of the states being considered as a subsystem. However, Nigeria is considered a subsystem in the committee of West African countries.

3.3   Instructional System

As a term or a concept, instructional system refers to a systematic way of planning, designing, implementing and evaluating the entire process of teaching to produce desirable outcomes on the part of the learners. From the definition, it is obvious that the task of a teacher to bring about an instructional system is difficult and at the same time complex. It is

difficult because it involves fusing together all elements in instructional process (teacher, learner, media, methods and strategies, objectives etc) to produce learning. However, with proper understanding of this unit and other related ones, it should not be difficult for you to prepare instructional packages based on systems approach.

Figure 3.1 is a representation of what instructional system. It comprises of seven components which are linked or connected with the arrows. Further emphasis on each of the components will be provided in due course.
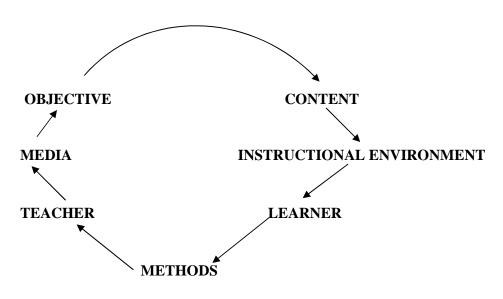
OBJECTIVE   **CONTENT**

MEDIA   **INSTRUCTIONAL ENVIRONMENT**

TEACHER   **LEARNER**

METHODS

Fig. 3.1:   Components of Instructional System

3.4   Instructional System Development (ISD)

Based on whatever is the perception of the instructional system developer, a choice can be made from purely Media Mediated Instruction (MMI) to Teacher – Mediated Instruction (TMI), Learner – Mediated Instruction (LMI) and Resource Person Mediated Instruction (RPMI).   A brief explanation on each of these approaches to instructional system development is hereby provided.

3.4.1 Media Mediated Instruction (MMI)

By this approach we mean an instructional system in which the traditional roles of a teacher during teaching – learning process are to be played by the employed instructional materials/media. Thus, the media act as teacher surrogates or mediated instructor (Balogun and Abimbade, 1999).   The exchange of roles between the teacher and the media is however deliberate and therefore systematically planned. The list of

media that could be used as teacher surrogate are inexhaustive. These include: the radio, the television, computer, textbooks, charts, films, video tapes etc.

Decision can be made by the instructional system developer to use the mediated media partially or totally. When partial media mediated approach is used, it gives room for some teacher intervention during the course of instruction. However, when total media mediated approach is used; there is no intervention of the teacher throughout the teaching – learning period.

3.4.2 Teacher – Mediated Instruction (TMI)

This approach to the instructional system development rests on the decision of the instructional system designed to allow the human teacher play the central role in the instructional process. This approach is teacher centred in nature.

The predominant method usually associated with teacher-centredness is the unadulterated lecture method. Since the focus of attention during the teaching – learning period is on the teacher, the learners are not made to play active role by design. They are therefore passive, inactive listeners and takers of notes most of time during the teaching – learning period. Another term used to describe teacher mediated instruction is "instructional personnel by design".

3.4.3 Learner – Mediated Instruction (LMI)

This approach to instructional delivery is also known as peer-mediated instruction. The approach allows the learners to learn from one another. Naturally, learners in a particular class identify those who are academically good and go to them for assistance. This approach has been in use for a long time in our school systems and seems to yield good results. This may not be unconnected with the facts like; those who are involved are of almost equal age, share similar aspiration, play groups and therefore close allies, speak the same language and they live in the same environment etc. However, when this approach is used, it is not supposed to be incidental or accidental as it has to be systematically planned for because it may generate into situations whereby the classroom may become chaotic, rowdy and unconducive arising from unhealthy rivalry among group members.

If the approach is to produce the desired effect, the teacher must make sure that the learner to be   used in place of the teacher must not be his favourite always. He is not to be completely absent from the class even though his intervention must be limited if not totally eliminated. His physical presence will provide an enabling environment for an effective learner mediated instruction environment. Every pupil must be given a chance to lead the class. Adequate time should be given to learner(s) who are to lead the class discussion prepare for the role to be played.

3.4.4 Resource Person Mediated Instruction (RPMI)

This approach is similar both in intent and actions with Teacher – Mediated Instruction in many aspects. In a Teacher – Mediated Instruction, the teacher is the professional and an expert by right in performing the art of teaching unlike in Resource Person Mediated Instruction where the "teacher" may be a professional in another field of study outside teaching.

In a situation like this, the resource person to be used needs to be guided by the expert teacher in his choice of contents, method/strategies, and media. This implies that meaningful input is to be embarked upon by both the teacher surrogate (resource person) and the expert/specialist teacher before the actual implementation of the instruction. When a non-expert is invited to handle a lesson, he/she is being used as instructional personnel by "utilisation".

3.5   Factors for Consideration in Instructional System Design and Development

There are some basic factors to be considered in designing and developing instructional system. They are to be considered in that they will determine the overall effectiveness of the teaching – learning process. The factors are to be regarded as "interrelated interdependent and complementary" (Agun, 1988). These factors are: identification of the task to be performed, stating objectives, selection of method(s) to be adopted, selection and integration of media, allocation of time, allocation of space, evaluation of performance and analysis of feedback.

3.5.1 The Task

The choice as to which of the instructional approaches to be used depend on the task to be performed. The task is the need to be fulfilled. The task is the content(s), subject matter or the topic(s) to be treated in a lesson or a term or during the course of study. It is therefore the propelling force in instructional system design and development. Similarly, the task is the activity, behaviour, or the skills the learners are

to learn, acquire, perform or exhibit leading to our conviction that learning has taken place.

In the educational systems, most if not all the expected "tasks" are found as packaged in different schools' curricular. Some are found in examining bodies' syllabi. Invariably, the problem associated with identifying what should be the tasks to be addressed by the schools as well as the teachers usually and naturally have been solved by the government as well as other concerned agencies. The major area of problem to most teachers is the challenge of system analysis.

System analysis involves logical and sequential breaking down of the components of the entire system with a view to determining the nature of its problem or challenges and providing workable solutions.

SELF-ASSESSMENT EXERCISE 1

i.   List four (4) aspects of system analysis.
ii.   Describe briefly the term "instructional task".

Technically speaking, system analysis consists of "Mission analysis, functional analysis, task analysis and consideration for methods and means: (Kaufman, 1968).

By mission analysis is meant the determination of the instructional system designer and the idea of what is he is aiming at involves setting a goal or rather "mission objective". Functional analysis refers to the grouping of the functions to be performed into various components that would make for a functional mission profile.
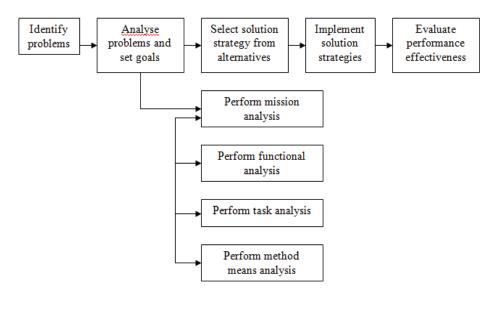
Functional analysis attempt to concentrate on possibilities as against impossibilities, it avoid trial and error approach. Functional analysis leads to "task analysis" and this is concerned with the determination of the sub-skills and the sub-contents that are required to learn an identified task. The "task" has to be systematically analysed with a view to determine the best strategies to be adopted for the accomplishment of the predetermined objectives.

As teachers in training, task analysis should be considered from the three domains of learning – cognitive (intellectual), affective (attitudinal/perceptual) and psychomotor (skills acquisition). An attempt by you to break down a general topic into bits by identifying sub-topics and sub-sub-topics is a right direction towards putting into practice the concept of "task analysis".

SELF-ASSESSMENT EXERCISE 2

You and your reading partner(s) should consider a topic in your area of specialisation. Each of you should perform "task analysis" of the topic selected by having sub-topic, sub-sub-topic(s). Now compare your analysis and use it to assess your ability to perform "task analysis".

Having performed "task analysis", the next step you will learn is called "method – means analysis". This step is equally crucial as it permeates all the steps prior to it. The major task here is to consider alternative means and methods which could serve as an alternative in case the one earlier considered fails or is not easily implemented as earlier thought. Implementation is the next stage and this leads to evaluation stage. Evaluation is done to provide data / information from which feedback is gotten.

Source: Salawu, I.O., Taiwo, S.A., and Aremu, G.B. (1994). *An Introduction to Educational Technology*. Afolabi Press Limited.

3.5.2 Stating Objectives

Instructional system design and development involves consideration for the purpose or the objective(s) to be achieved. Objectives are the reasons certain things are embarked upon (Oluokun and Olayanju, 2000).

Objectives can be called goal or aim based on the intended outcomes. Three levels of educational objectives have been identified. These are: the ultimate goal, mediate goal, proximate goal and specific/instructional objective.

According to Wheeler, the ultimate goal/objective is that which usually takes the longest period to achieve. Examples of such are found in national educational goals of any nation. In Nigeria, for example, the nation's goals as contained in the National Policy of Education (2004) are:

a.   to build a free and democratic country
b.   a just and egalitarian society
c.   a united, strong and self-reliant nation
d.   a great and dynamic economy
e.   a land of bright and full opportunities for all citizens.

At another level, the nation's general educational goals were generated. Further, at another closer level, objectives were drawn for each of the disciplines in the curriculum. The lowest level is at the classroom where individual teacher writes specific objective(s) for every lesson to be taken.

For this purpose, we shall concentrate our attention on how to write specific / instructional / behavioural objectives. In writing/stating instructional objectives, the following criteria are to be met:

a.   A behavioural objective should be stated in simple and precise language
b.   Action words (verbs) to be used must be; observable, testable or measurable. Such words to be used include: describe, write, list, identify, draw, discuss, explain, measure, narrate, pronounce, calculate, simplify (in mathematics), construct, distinguish, use, mention, record, sing, etc
c.   Since instructional objectives are learners' oriented, learners should therefore be the subject of the statement of objective(s)
d.   The statement of objective should show the level or degree of performance expected from the learner. This could be expressed in figure, percentage or through the use of such words like; without any mistake; correctly, at least ……..
e.   Another major criterion that a statement of objective should have is the time element. The expected period for the change in behaviour to be effected should be stated. The expected time lag could be between 30 to 40 minutes in a single lesson at the primary and secondary schools and between 1 to 2 hours at the

tertiary level. The question to ask is what is or how long the lesson would last.

4.0 CONCLUSION

The instructional system designer has to make a choice from the available approaches to instructional system design and development. The choice is not to be made hastily. Rather, it must be systematically arrived at for the overall interest of the system. The success of an instructional system would be determined by the designer's ability and ingenuity in the analysis and synthesis of the various elements of instructional systems.

5.0 SUMMARY

In our discussion of the instructional systems and development in this unit, we defined the term "instruction" and a "system". We went further to describe the term instructional systems. Other term that explanations were provided on was the instructional system development. You were informed in this unit that instructional systems design could take four forms – media mediated instruction, teacher mediated instruction, leaner mediated instruction and resource-person mediated instruction.

Whatever is the choice of an instructional system designer/developer, she/he should consider factors as: the task, and objectives, when embarking on the task of evolving a functional instructional delivery system.

6.0 TUTOR-MARKED ASSIGNMENT

1. Explain the following terms: instruction, systems, instructional system and instructional system development.
2. Discuss four approaches to the task of designing instructional system.

7.0 REFERENCES/FURTHER READING

Balogun, T. A. and Abimbade, A. (1999). *Introduction to Instructional Technology*. Ibadan: Centre for External Studies. University of Ibadan. pp. 17 – 33.

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UNIT 4   SYSTEMS APPROACH

CONTENTS

1.0   INTRODUCTION

This unit introduces you to systems and systems approach, instructional design and instructional development and it will also discuss the five logical reasons for adopting instructional design and development principles and techniques in our teaching.

2.0   OBJECTIVES

At the end of this unit, you should be able to:

- define systems and systems approach
- bring out the differences between instructional design and instructional development
- give at least five logical reasons for adopting instructional design and development principles and techniques.

3.0 MAIN CONTENT

3.1   System and Systems Approach

These two terms are becoming more relevant in issues relating to human endeavours these days. It is imperative to state that these two terms are quite popular in the literature of education today (Kaufman, 1968).

3.2   A System: Definition

A system by way of description is a holistic way of viewing things. It generates from the idea that a "whole" is made up of separate parts but each part works cooperatively to make for efficient performance. In other words, the philosophical saying – "A whole is greater than the sum total of its parts" actually describes what a "system" is. According to Kaufman (1968), a system is defined as "the sum total of separate parts working independently and in interaction to achieve previously specified objectives". This "system" view can be applied to educational and instructional processes. This is so when "education" and "instruction" are viewed as concepts with separate and yet interlocking parts which function together to achieve predetermined objectives. When "systems" is used in an applied form as is the case above, we then talk of "systems approach". Systems Approach (SA) can thus be defined as a systematic process of solving problems, particularly educational or instructional problems.

3.3   Systems Approach

Systems approach is a problem-solving process in which the problem solver takes series of steps aimed at solving a particular identified educational problem. Broadly speaking, systems approach comprises of two major parts, namely:

(i)   system analysis, and
(ii)   system synthesis.

By system analysis, we are speaking of a process whereby a given problem is broken down into bits. It is at this stage that the actual problem is identified and analysed with a view of setting goals or objectives. Technically speaking, system analysis consists of "Mission analysis, functional analysis, task analysis and consideration for methods and means" (Kaufman, 1968).
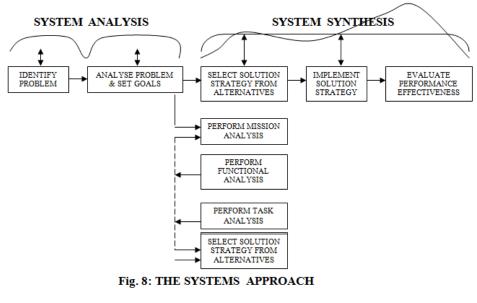
Mission analysis, on the other hand refers to the determination of the end product of the system analysis. It includes the various steps of identifying an overall "mission objective."

Functional Analysis

As is expected, it is closely related to mission analysis. It consists of breaking down of functions earlier identified under mission analysis with a view of grouping them into various components that would make for a functional mission profile.

Functional analysis is the attempt used to leave out impossibilities and concentrate on "possible" options. Since functional analysis centres on "specifics" rather than "general", it naturally leads to "task analysis". Task analysis is concerned with the determination of the sub-skills that are required to learn an identified task. The "task" has to be analysed to make it easy to identify the best strategy that could be adopted to accomplish the objective.

The remaining system analysis step is called "method-means analysis". This step is important in the sense that at every stage of system analysis, there is need to consider "alternatives" that are considered best in terms of speed and accuracy in the attainment of set objectives.

In system synthesis, available data from system analysis stage are utilised to select solution strategies, implementing solution strategies and the evaluation of the total system in the environment for which they were designed. The discussion on systems approach can be summarised in a model form shown in the Figure 8.

Fig. 8: THE SYSTEMS APPROACH

Source: Kaufman, R.A: A System Approach to Education: Derivation and Definition in A-V Communication Review, Vol. 10 No. 4, Winter, 1968.

3.4   Principles of Systems Approach

There are some fundamental principles of systems approach that the presented model succinctly demonstrates.

They are: principles of wholeness, principle of systemisation, principle of environment, principle of optimisation, principle of variety, and principle of equifinality.

3.4.1 Principle of Wholeness

The first principle asserts 'wholeness' of a typical system. By this theory, it is implied that rather than placing emphasis on separate parts of a system, the entire system should be recognised as an indivisible whole of which what happens to any part automatically affects every other part.

3.4.2 Principle of Systemisation

The second principle is that which recognises a system as a systematised process rather than dis-organised, unplanned line of thought.

The principle of systematisation believes that planning based on concrete data should preceed action and that in planning, orderliness and sequence should be given adequate attention.

3.4.3 Principle of Environmental Compatibility

Every system operates within a given systems environment. In other words, it is only when a system is made to function in a conducive and appropriate environment that one should expect appreciable results. The idea of systems environment becomes relevant when it is realised that systems vary according to point of focus. We can then talk of a system, a sub-system and supra-system. The country, Nigeria, can be considered as a system made up of several sub-systems (political system, economic, educational and social systems). Immediately we focus attention on any of the sub-systems for closer study or analysis, a sub-system becomes a system while other related units or parts become the sub-systems.

The major point to note is that the terms – a system and sub-systems are used relatively depending on situations surrounding the usage for what is regarded as "a system" somewhere can become a sub-system elsewhere. What is certain is that all systems, whether sub or a system, establishes contact with their environment for sustained supply of energy, information and other input that might be deemed necessary for system survival. It is "this environment" that serves as life-wire of any system that is being referred to as the systems environment.

3.4.4 Principle of Optimisation

The fourth principle of system theory is that of "optimisation". A system designed should be able to function in a full capacity to achieve predetermined objectives.

The goal of a functional system is to apply all necessary inputs that would lead to the desired output. To achieve "optimisation" capacity, all the units must be seen to be functional. For example, for a school system to set its objectives, all within the school system including the gardener, kitchen staff, administrative staff, teaching staff and students need to work full strength. Half-functioning or non-functioning of any or a combination of them might not lead to a successful result.

3.4.5 Principle of Variety

The fifth principle of system theory emphasises "variety" as an important element of a system. Variety used here encompasses many things e.g. ideas, techniques, means, methods, procedures, strategies and viewpoints.

A system designer must recognise that there are always alternative means of solving a problem. However, the designer must look for the most relevant, or in some cases, the best choice that could be systematically used to solve a given problem.

3.4.6 Principle of Equifinality

The sixth and final principle is that of "equifinality". This theory recognises a system or system approach as a process in which there is no beginning and no end. In other words, problem-solving is a continuous process, in fact, solving of one problem could be an invitation to another problem.

4.0   CONCLUSION

The six principles of system approach were discussed with adequate reflections on the implications of each to the teaching and learning process.

For a teacher to be effective as a teaching staff and administrator, she/he needs to apply all these principles, where need be, from time to time. Most of the problems teachers and school administrators are having come from their inability to understand the basic principles of how the system works.

5.0   SUMMARY

The main thrust of this Unit is an attempt to define a system, and systems approach. Further attempts were made to discuss the principles of systems approach. You would recall that the teacher and the school administrator need to have full grasp of the principles of system approach so as to empower them to implement relevant principles as the need arises.

6.0   TUTOR-MARKED ASSIGNMENT

1.   (a)   What is a system?
        (b)   What are the features of a system?

2.   Identify the various components of a system.
3.   Bring out the salient difference between instructional design and instructional development.

7.0   REFERENCES/FURTHER READING

Abimbade, A. (1997). *Principles and Practice of Educational Technology*, Ibadan: International Publishers Limited.

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UNIT 5   FACTORS   OF   METHODS,   MEDIA SELECTION, TIME AND EVALUATION IN INSTRUCTIONAL SYSTEMS DESIGN AND DEVELOPMENT

CONTENTS

1.0   Introduction
2.0   Objectives
3.0   Main Content
    3.1   Factors of Methods, Media Selection, Time/Space and Evaluation in Instructional Systems Design and Development
        3.1.1   Factors of Methods
            3.1.1.1 Method Peculiarities
        3.1.2   Factor of Media Selection
        3.1.3   Factor of Space
        3.1.4   Factor of Time
        3.1.5   Factor of Evaluation
            3.1.5.1 Types of Evaluation
4.0   Conclusion
5.0   Summary
6.0   Tutor-Marked Assignment
7.0   References/Further Reading

1.0   INTRODUCTION

This unit is a continuation of a discourse in Module 2 Unit 4 on factors for consideration in an instructional system design and development.

You would recall that in Unit 2, attempts were made to discuss the relevance of the objectives as well as the task analysis as they relate to the question of designing and developing an effective instructional system.

This concluding aspect of the topic in Unit 5 will discuss the role of factors of methods, media selection, time and evaluation of the designing and development of instructional systems.

2.0   OBJECTIVES

At the end of this unit, you should be able to:

- explain and discuss the roles of methods, media, time and evaluation in designing and developing instructional systems

- explain and discuss factors to consider in the selection of media, methods and evaluation strategies in the designing and development of instructional systems
- develop an instructional system to teach a named topic.

3.0 MAIN CONTENT

3.1 Factors of Methods, Media Selection, Time/Space and Evaluation in Instructional Systems Design and Development

3.1.1 Factor of Methods

A question on how this lesson/topic should be taught so that learners learn is one question that could be answered by reflecting on the use of appropriate methods for teaching. It is one thing for a teacher to know what s/he wants to teach (content/subject matter), it is another thing for him/her to choose and use appropriate methods. It is because of this reason that teachers are expected to be very vast in knowledge about methodology.   Whereas, methods are vehicles through which information is presented to make it easily learned by the students. Methodology is the study of methods, and in this case, our concern is various methods of teaching. Egunjobi, Olude, Shehu and Mu'azu (2005) refer to methodology as the study and practice of various methods of teaching.

An instructional systems designer and developer considers the factors of methods as very important because wrong choice and usage of teaching methods affect learning. To make learning occur, the following points are to be considered during the designing and implementation stage of an instructional system:

3.1.1.1   Method Peculiarities

The choice of a method of teaching has its own peculiarities which are therefore unique to each one. For instance, some methods can be used by the teacher absolutely while some will naturally call for the involvement of both the teacher and the learners. Generally, methods can be classified into two in terms of the degree of control by the teacher and the learner in the teaching – learning process. These are:

(i)   Teacher-centred methods, and
(ii)   Learner-centred methods

Some of the teacher-centred methods are lecture, demonstration and structured discussion. Those under the learner-centred include role play,

games, simulations, programmed instruction (textual and or electronic), project, unstructured discussion, microteaching, among others.

The choice of each of the methods used by the teacher depends on a number of factors such as "the educational task, the learner and our objectives, available resources, cost and the size of the audience." (Balogun and Abimbade, 2002).

3.1.2 Factors of Media Selection

The teacher, being the instructional system designer, has a wide variety of materials from which to select.   Such factors like: media appropriateness, quality, quantity, size, ease of use, etc. need be considered in the choice of media for any given lesson. It is imperative for the teacher to consider the time that the lesson will last so as to be able to determine the quantity of materials to utilise. S/he has to consider the appropriateness of the media for the choice of the method(s) and selected instructional strategies. The teacher should consider the role(s) of the learners during the instructional process in terms of learners' access to the media. These tasks are necessary to ensure effective media mix during instructional delivery.

No single medium can teach a particular concept/topic from the point of analytical teaching. By analytical teaching we mean the adoption of a systematic approach to the whole business of instruction. This is a way of breaking down the topic into various units. Efforts are to be made to identify relevant/appropriate instructional medium/media for the teaching of each of the units.

You are to note therefore that the issue of what media to select and use in any teaching-learning process goes beyond making a decision by simply considering the topic on its face value. The implication of this to you as a teacher is that you need to develop what is called systems view. You should also be ready to apply the concept of multimedia utilisation in instruction. Multimedia utilisation as a term means "the use of a variety of instructional materials during teaching and learning process." It allows for combination of different family of media such as: the use of the radio plus the posters or charts, the use of real objectives (realia) plus photographs to teach.   Only a skillful teacher can do this successfully as it calls for expertise. The use of variety of media calls for the ability to manage time effectively.

3.1.3 Factor of Space

Most teaching-learning process takes place in the classrooms.   For teaching to produce desirable outcome (learning), adequate space is

needed. The available space for teaching and learning should therefore be large enough to allow for free movement of the teachers in and around the classroom. Pupils should also be free to move about. The space must be sufficiently large to accommodate learning activities and the furniture. Pupils' comfort should not be mortgaged as the overcrowded class will make independent study, small group study, dramatisation, especially structured one, difficult. In places where there are no separate laboratories for the teaching of science subjects, especially in primary schools, practical exercises will be difficult since practicals are essential in most teaching subjects, large space should be created for learners' comfort.

3.1.4 Factor of Time

Time determines a lot of things in the design of an instructional system. An instructional system designer is interested in knowing when instruction will take place. The duration of the lesson, the time allocated for the introductory/opening aspect of the lesson; lesson delivery, and time that learners are to be involved. The time for evaluation is also important. Precision is the key word even when there may be variation in the accomplishment of what is being planned on paper and the actual live classroom experience. It is expected that a good teacher will manage time well.

3.1.5 Factor of Evaluation

As a term, evaluation is a value laden concept. This is because it naturally leads to making judgment on things already done or being done. In terms of instructional design system, evaluation is used to determine the totality of the effectiveness of the teaching-learning system. In other words, the teacher, the objective(s), the learners, the methods, the instructional media and the environment that are involved in the whole business of instructional process are evaluated with a view to determining their effectiveness or otherwise. The main purpose of evaluation is to identify area(s) of weakness and provision of corrective measures. The ultimate objective, according to Balogun and Abimbade (2002), is to improve the quality and quantity of what is learned by students.

If evaluation is properly carried out, it assists all the stakeholders in one way or the other. For the teacher, s/he is able to ascertain the degree of understanding, and mastery of the purported imparted knowledge, skills and attitude. It also affords him/her the opportunity of measuring how far the stated objective(s) have been accomplished. You will realise that evaluation serves as quality control device. This is because through it,

areas of weaknesses are identified for immediate corrections while efforts are made towards rectifying other difficult areas of the design.

To the learners, evaluation assists them to wake up from their slumber as through it, they have the opportunity of determining whether they have gained or not from the teaching-learning process. It gives room for the individual self-assessment while it also encourages the weaker learners to seek further assistance.

3.1.5.1   Types of Evaluation

Generally speaking, there are two types of evaluation, namely: formative and summative evaluation. You must have come across teachers who will not ask you or the class questions until the end of the lesson. Also, you must have learnt that prior to the introduction of the continuous assessment in the Nigerian education system, what we had was a one-shot examination that used to come up at the end of the term. Thus, in an academic session of three terms, learners were subjected to two terminals and one end-of-year examinations. It should be mentioned that during that time, for a pupil to be promoted or not, his/her past academic records, no matter how good or bad, were never used. Instead, it was the overall academic performance of the learner that was used. This is typical of what is called summative evaluation. However, formative evaluation is not a one-shot type of evaluation, rather it is continuous, systematic and its results are cumulative.

4.0   CONCLUSION

In this unit, efforts have been made to discuss the various additional factors that must be considered in the design and development of an instructional system. Evaluation has been considered as basic to any instructional design, the different types of which were discussed in this unit.

5.0   SUMMARY

As earlier mentioned, the task of an instructional developer is very difficult yet highly interesting. An instructional developer must take note of the need to integrate all the various factors as highlighted and discussed in this unit. Recall that the factors of methods, media selection, time allocation and evaluation were given due consideration.

6.0   TUTOR-MARKED ASSIGNMENT

List four major factors you would consider in planning for an instructional system?

7.0 REFERENCES/FURTHER READING

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MODULE 3   INSTRUCTIONAL   MEDIA
**   PRODUCTION**

UNIT 1   TECHNIQUES OF INSTRUCTIONAL MEDIA
**   PRODUCTION**

CONTENTS

1.0   INTRODUCTION

In the previous module, we discussed instructional design, systems approach, factors, time allocated and evaluation and so on. In this unit, you will be exposed to the three main ways by which you can make instructional resources available for your use as a teacher.

The three approaches to be discussed are not entirely new to you as you will soon discover. You are to note that your knowledge of media production is not to be on paper only. As a seasoned teacher, you are to put your knowledge into practice. You should be rest assured that you will be guided to achieve this.

2.0   OBJECTIVES

At the end of this unit, you should be able to:

- list three requirements for the production of instructional media
- mention and explain three types of production of instructional media.

3.0   MAIN CONTENT

3.1   Types of Production of Instructional Materials

It is very important to state clearly here that media production skill is an integral part of teacher education. Although we have several commercially produced media, but local production of materials is always encouraged. A locally produced material has three main characteristics that cannot be ignored when compared with the commercially produced ones. They are: relevance, appropriateness and validation.

Local production of media is best done when it is supervised and conducted by a production specialist. However, with just a little skill, exposure and practice, the classroom teacher should be able to produce some instructional materials that can be used to facilitate teaching-learning activity. Time, equipment and resources are other basic needs for a teacher to be acquainted with the production techniques. A specialist would normally interpret scripts; plans short schedule, arrange sets, scenes and so on as he prepares for production. For a classroom teacher, rough sketches of envisaged task must precede production.

There are three bases of production of instructional media. They are:

(1)   Imitative media production
(2)   Adaptive media production
(3)   Creative media production

3.1.1 Imitative Media Production

This is a situation where the producer follows a particular pattern of production based on the effort of others who have produced similar media in the past. It requires the use of the direction or model that is used by other people. For instance, when a teacher is involved in copying out pictures, tracing projected images or making some other constructions based on a given direction, all these activities are typical examples of imitative media production.

Most of the works of local production by classroom teachers also follow the imitative pattern. This happens to be the simplest level of media production as it is done to meet a certain standard which had already been established.

3.1.2 Adaptive Media Production

This deals with the production of media which have a sequence of production through a new form or new way. This is an innovative positive change added to the process of production, thereby changing the form of the produced media from its original form. The available media may serve as a guide, but ultimate production requires the ingenuity of the producer as new forms of ideas are incorporated into the final product. A prototype or a model or even a picture of the prototype may exist, and may be used as guide. However, the ultimate production is based on individual's ability to identify problem and to work out solution to that problem on her/his own. Adaptive production therefore calls for individual judgment, self-direction and imitation.

3.1.3 Creative Media Production

This is the peak of media production as it involves the ability to define and solve problems in an original way without recourse to the direction or works of others. Such production is based on the original concepts in design and production. At this juncture, it is important to encourage you students to be more creative, inventive and bring originality to your thoughts and production.

It is advised that before a teacher decides to produce any material, efforts should be made prior to this decision to source for commercially produced ones. Any decision to produce a material must be contingent on the non-availability of commercially produced one. More importantly, a teacher may need to determine whether there is enough time, personnel and financial backing with which to produce the needed materials before s/he embarks on production.

3.2   Production Techniques

As said while introducing this unit, media production technique is a prerequisite for teacher education programme, learning some simple production techniques may be inevitable. Some materials may be required for teaching-learning activity, but are not readily available in the market to buy, and you don't even know how to produce them despite the simplistic nature of production; such a topic will not be properly understood by pupils due to the two weaknesses if you decide to teach without the needed materials.

The onus lies on teachers to utilise their leisure time judiciously. Teachers should learn how to make some of these materials, thereby acquainting themselves with additional relevant skills to assist them in their field of endeavour. Such skills include: tracing, copying, cutting and mounting.

3.2.1 Tracing

Tracing is the technique employed to reproduce the exact size of a diagram from the original through the use of a transferring medium that may be placed below or above the copy.

Types of Tracing

There are many types of tracing, but for this discourse, three types shall be considered. They include:

1. Using carbon paper
2. Using tracing paper
3. Using light (tracing) box.

Required Materials

⇒ Original surface (coloured/black and white)
⇒ Plain sheets of paper
⇒ Pencil / stylus point
⇒ Drawing table
⇒ Masking / Cellotape / Thumb pin etc.
⇒ Carbon paper (single surfaced), tracing paper
⇒ Light box
⇒ Ruler

(1) Using Carbon Paper

Tracing with carbon paper is usually done for diagrams that are not bigger than foolscap sheet size. This allows for neatness and accuracy. Two or more carbon papers could also be joined together to reproduce bigger diagrams, but a high level of skills will be required.

Using carbon paper is simple and straight forward. Cut the original copy from where the drawing/diagram to be transferred/reproduced is. The preferred carbon paper is a single surface type. It should be noted that the paper in which the diagram is to be copied or reproduced should be neat, clean and smooth. The order or the arrangement will be the original on top, next to it is the carbon paper and lastly, the smooth,

clean and neat copying surface (where the original picture is to be reproduced). In order to allow for carbon copy with accuracy, the three i.e. the original, carbon paper and the sheet of paper could be cellotaped or pinned together.

(2)   Using Tracing Paper

This method requires only two surfaces to reproduce any diagram. Here, the use of tracing paper is necessary. Tracing paper is a translucent, milky white coloured paper. Light cannot pass through paper, but a tracing paper retains and spreads light on its surface. This allows it to show conspicuously the diagram behind it. Tracing paper is sold in rolls and draughtsmen make use of it in their work.

The original diagram will be placed behind the tracing paper. Diagrams in sizes bigger than tracing carbon paper can be achieved here easily.

(3)   Using Light (Tracing) Box

As the name reflects, the use of electricity to produce light in a four cornered box that has a white   Perspex lid cannot be compromised. Inside the box, we may find two light bulbs or a two feet fluorescent tube depending on the size of the light box. The tracing method cannot be used where there is no source of electricity unlike the other two preceding methods that can be used anywhere.

Steps Involved

For each of the three steps mentioned above, you are implored to carefully follow these steps in this order:

Using Carbon Paper

1.   Get a clearly outlined picture or chart.
2.   Ensure that the surface into which the drawing is to be traced is clean, free from grease and dust.
3.   Place the original copy on top, and put the plain sheet underneath.
4.   Place a sheet of carbon paper in between the original and the plain paper. Check if the carbon paper is correctly placed.
5.   Begin to trace all points of the original with HB pencil or use a stylus pen. Do it with utmost care.

Using Tracing Paper

1.   Cut the expected size of tracing paper to match the size of the original picture sheet.

2.   Pin or clip down the original onto a tracing board.
3.   Press down the tracing paper on the original with your left hand, and begin to trace with HB pencil.

Using Light Box (Tracing Box)

(1)   Ensure that the surface of the tracing box is clean.
(2)   Paste with cellotape the original on the tracing box.
(3)   Place the plain sheet on the pasted original picture.
(4)   Connect the light box to the source of electricity and switch it on.
(5)   Begin to transfer/trace the drawing with utmost care.
(6)   Remove all materials from the surface of the light source after copying, and put off the source of electricity, remove the plug from the main source.
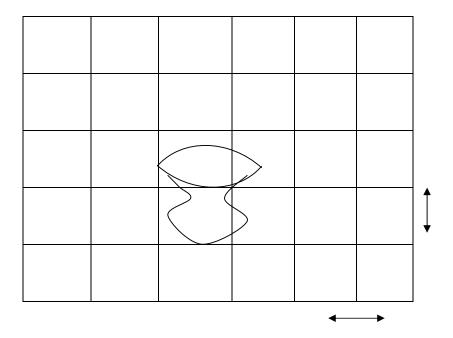
3.2.2 Copying

As in tracing treated above, copying is not far-fetched too. Copying can be referred to as a method of reproducing diagrams with the same size. It can also be proportionately enlarged or reduced. There are two basic methods of doing this. They include:

(a)   The grid method
(b)   The pantograph method.

(a)   The Grid Method

This method is very easy in that it gives room for the reproduction of an existing drawing, symbols, letters etc. It employs squaring method whereby the original image is subdivided into squares/units. The lines of the squares are called a grid system or pattern. Original drawing can be enlarged, reduced or drawn in the exact size using this method. See Figure 9 that follows.

Fig. 9: The Grid Method

Original

Steps involved in copying

1.   Square up the original as above.
2.   Square up the surface onto which the drawing is to be copied.
3.   Ensure that it is relevant to the desired size.
4.   Number both the horizontal and vertical lines.
5.   Place the original copy in front and copy its content to the new squared sheet.
6.   Be as accurate as possible and juxtapose the two drawings eventually.
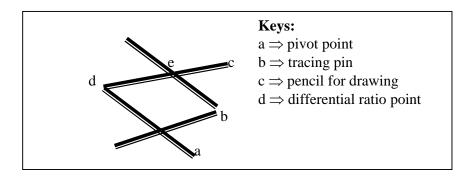
Enlargement Process

In case of enlargement, all you need do is multiply the original size by the number or level of enlargement. For instance, if the vase drawn above is to be enlarged to thrice the original size, then the new squares will be enlarged three times as big as the original squares.

Reduction Process

This is just the opposite of the above enlargement process. For instance, if you are to reduce the original by one quarter (¼), then the new squares that you draw have to reflect this by being divided by four.

(b)   Pantograph Method

This method employs the use of an instrument called pantograph. A pantograph is a simple copying device used to make an enlargement, reduction or a copy of the exact size for reproduction of drawings. It is made of an assemblage of four pieces of wood, metal or plastic bars. Each bar contains a series of calibrated holes. By hinging these bars together at certain predetermined points, several ratios in enlargement and reduction can be realised depending on the model.

Keys:
a ⇒ pivot point
b ⇒ tracing pin
c ⇒ pencil for drawing
d ⇒ differential ratio point

Method of using the Pantograph

1.   A broad and smooth working surface is required.
2.   Fix the pivot point at the lower left corner of the working surface.
3.   For enlargement, fix the tracing point at b.
4.   Pencil should be fixed at point c.
5.   The tracing point should be used to trace over the original.
6.   Support the drawing with the other hand as you are drawing.

To Reduce

a.   Reverse the position of the pencil from c to b and the tracing pin from b to c.
b.   Carefully trace with tracing point now at c and the pencil at b will reproduce a reduced drawing.
c.   Note that changing the hinging position at d and e will change the ratio of enlargement or reduction.

To Copy Exact – Size

a.   Locate pivot point at b
b.   Locate tracing point at a
c.   Pencil position should be at c
d.   By this, the original picture will be transferred to a.

SELF ASSESSMENT EXERCISE

i.   Describe the arrangements of materials to be traced in each of the three tracing techniques?
ii.   With the aid of tracing paper, trace any drawing of your choice from a textbook. Make flash cards without destroying the book.
iii.   Specify the difference between tracing and copying.

4.0 CONCLUSION

It is not advisable to teach a child only how to eat fish, but teach him/her how to fish. Every teacher should seek to think outside the box in order to bring a lot of innovations to the teaching career through the use of common and locally produced materials.   The simple production techniques as described are straight forward and practicable. Teaching is incomplete without the use of locally produced instructional materials.

5.0   SUMMARY

As we have discussed, a locally produced instructional material should have relevance, be appropriate and have validation as added advantages over the commercially produced ones. With persistent practice, you will sharpen your skill in the area of production of instructional media. In addition, the three types of production of instructional media are necessary in utilising media production.

6.0   TUTOR-MARKED ASSIGNMENT

Mention the three types of production of instructional media that are necessary in utilising media production.

7.0   REFERENCES/FURTHER READING

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UNIT 2   IMPROVISATION

CONTENTS

1.0   INTRODUCTION

Media production skill is a core prerequisite for teacher education. The fact that most needed media are either not available or are expensive, has necessitated the need for improvisation. Factors that influence improvisation of instructional materials and typical improvisation techniques are going to be looked into in this unit.

2.0   OBJECTIVES

By the end of this unit, you should be able to:

- explain what you understand by the term 'improvisation'?
- state in a sequential order and the steps involved in improvisation with paper *mache*
- highlight any three production techniques, and give their detail description.

3.0   MAIN CONTENT

3.1   Instructional Media Improvisation

One very important factor in the production of instructional materials by students, teachers and resource persons is the use of locally available raw materials. By the term improvisation, we are referring to selection or provision of substitute for something not readily available. It is the

process by which educational materials can be designed and developed using locally available materials to meet specific instructional needs.

In addition, improvisation is linked with the concept of self-reliance. You need to understand the fact that when we make use of the available resources in our environment, it will be easier for us to withstand the present economic recession. It will help us spend less on imported and expensive commercially produced media.

In the course of improvisation, models can be used when the real media is not available, diagrams can be used when real pictures are not readily available for use in the course of teaching and learning.

The initial effort made on improvisation by teachers was mainly focused on finding an alternative to the highly expensive instructional media. This eventually led to the discovery and invention of certain local materials which have been used in producing a lot of local improvised instructional materials in place of the expensive and very scarce foreign instructional media.

Attempts by teachers to solve the problem of non-use or non-availability of instructional materials have led to improvisation of media like parts of human body: eye, heart, skeleton, and others like dresses, vehicles, flutes, etc. One common thing about improvisation of these materials is that there is extensive use of local materials, especially those that are within the reach of the developers.

In the making of an "aircraft" for example, used or neat paper, bottle tops, gum etc. can be used. Imported "gum" can be improvised by adding a small quantity of "petrol" on the roughages (white plastic packer usually used to accompany newly factory produced items in cartons) inside a container. Stick can be used to stir. The end product is adhesive gum which can be used in mounting. Mounting implies permanent fixing of diagrams or pictures (graphics) on another surface.

The materials that can be improvised are many and varied. Although, in terms of functions/features, there are bound to be variations from the original items. The variation can be in terms of functions, size, colour etc.

3.2   When can Improvised Instructional Media be used in the Classroom?

Improvised instructional media can be used in the classroom when the real:

1.   media is very scarce or not available for use
2.   instructional media is insufficient for the use of all the learners in the classroom
3.   instructional media are very expensive for the teacher and the students to afford
4.   instructional media are very fragile to handle by the students or they are hazardous to both the teachers and learners.

3.3   Factors Influencing Improvisation of Instructional Materials

Factors influencing improvisation of instructional materials can be viewed in two ways. They can either be factors promoting or militating against improvisation of materials.

(a)   Factors promoting improvisation of instructional materials include:

     (i)   It discourages the importation of luxury items
     (ii)   It promotes local sourcing of raw materials for use in teaching-learning activity
     (iii)   It facilitates self-reliance.

(b)   On the other hand, the following can affect it adversely:

     (iv)   Fear of copyright laws
     (v)   Lack of motivation on the part of the teachers
     (vi)   Not all instructional material can be improvised
     (vii)   Possibility of loss of vital part/information.

3.3.1 Improvisation with Paper Pulp/Paper Mache

Through the use of paper pulp/*papier mache*, a great number of instructional materials can be improvised. In doing this, find old or new unused newspapers or unused paper, and follow these steps.

(i)   Tear the paper into pieces
(ii)   Soak the pieces in water for a short time
(iii)   Pound the soaked pieces of paper in a (small) mortar
(iv)   Prepare starch
(v)   Mix the pounded paper with starch
(vi)   Ensure that the quantity of starch is proportional
(vii)   Knead very well till it looks smooth
(viii) You can now use it for moulding.

From the step viii, you can now use your moulding to create anything you desire like: the abacus, map, digestive systems, shapes, etc.

3.3.2 Improvisation with Cardboards, Hardboards and Plywood

There are some instructional materials that cannot be effectively made with *papier mache*. Those ones can be made with using cardboards, hardboards and plywood. In the area of improvising for slides, weaving, overhead projector, transparency, cardboard will be an excellent material for producing them.

Different shapes can be cut from hard board and plywood; making the abacus, pantograph and many more.

4.0   CONCLUSION

We have studied in this unit some of the factors that influence improvisation of instructional materials and typical improvisation techniques.

5.0   SUMMARY

Improvisation is always a necessary technique to safeguard teaching-learning activity from problem of scarcity of required media in the classroom setting.

6.0   TUTOR-MARKED ASSIGNMENT

1.   What improvisation technique would you employ to show a film in a classroom that has been wired but yet to get connected to the main supply of electricity?
2.   List four disadvantages of improvisation with specific reference to the production of a particular material.
3.   Mention one material/medium that can be used to improvise for the teaching of the following:
     (a)   the location of each continent in the world with their longitudinal differences
     (b)   the digestive system and alimentary canal of a mammal
     (c)   multiple production of a particular image
          4   Name five instructional materials you can build with *papier mache*.

7.0   REFERENCES/FURTHER READING

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UNIT 3   LETTERING

CONTENTS

1.0   Introduction
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                3.1.2 Qualities of Good Lettering
                3.1.3 Instruments and Materials for Lettering
        3.2   Lettering Production Techniques
        3.3   The Place of Lettering in Media Production
4.0   Conclusion
5.0   Summary
6.0   Tutor-Marked Assignment
7.0   References/Further Reading

1.0   INTRODUCTION

Communication is the art of passing information, message, ideas, concepts, values, etc. to people either in signs, writing or orally. Indeed, lettering is the art of writing or constructing alphabet letters from A – Z. Therefore, lettering is an aspect of communication. The letters of the alphabet are used purposefully for functional reasons such as decorate surfaces in singular form, words or as phrases. It is also the systematic way of designing and constructing alphabet letters with or without aids.

2.0   OBJECTIVES

At the end of this unit, you should be able to:

•   write letters of the alphabet in Gothic, Roman and in Italic forms
•   define the word lettering
•   construct letters of the alphabet from (A – Z) in both upper and lower case letters
•   list the classes of letters with examples.

3.0   MAIN CONTENT

3.1   Types of Lettering

Letterings are classified into two, namely:

(i)   The block letters, and
(ii)   The scripts letters.

Block letters are constructed while scripts are freehand written letters. The art of freehand lettering is known as calligraphy.

(1)   **The Block Letters:** The block letters are subdivided into Gothic and Romans.

(a)   **Gothic** are uniformly thick and rigid. They have no projective or serifs. Examples are:

 Etc

They are usually used for signposts, posters, bill boards, etc. The letters are readable from a far distance.

(b)   **Romans:**   The roman letters are romantic in nature because they are usually attractive to the eyes. Their thickness varies as the horizontal strokes are rather thinner than the vertical strokes.   The letters have some ornamental projections called serifs. Examples are:

A B C

Roman letters are suitable for printing textbooks, magazines and newspapers. The Holy books, journals, periodicals and important texts use roman letters.

(2)   **The Scripts:**   These are freehand letters which are further classified into two, namely:

(a)   **Italics** which are either caps or low and are always seen tilted to the right e.g.
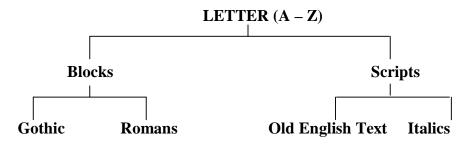
A B C etc.

a, b, c, d, e

They are normally used to lay emphasis on points being made and to open up paragraphs in some books.

(b)   **The old English Text:**   These are very complex and ornamental letters used to open up paragraphs or chapters in the Holy books e.g.

A B C etc.

a, b, c etc.

3.1.1 Letter Classification

LETTER (A – Z)

```
              LETTER (A – Z)
             /              \
         Blocks            Scripts
        /     \            /      \
    Gothic   Romans   Old English Text   Italics
```

The classes of letters are either bold or thin, they are represented in upper capital (caps) in the lower case (low) form.

3.1.2 Quality of Good Lettering

(a) **Suitability**

The form or character of the letters chosen must be suitable for its purpose. Arrangement and emphasis on each letter are also important.

(b) **Legibility**

The letters constructed must be readable, simple and should be arranged in orderly manner without losing its beauty. A letter with good contrast with the background makes reading easier.

(c) **Good Spacing**

Letters must have good space. It must not be too close or too wide apart. When they are too close, reading becomes difficult. Likewise, when they are too wide apart, they are no longer united. The character of letters, their weight, and width often determine the amount of reasonable space between them. Letter 'O' and 'I' spaces are different, while 'O' and 'I' can be used as standard for spacing.

3.1.3 Instruments and Materials for Lettering

(i) **Pencils:** They are of different grades, namely:

    (a)   Soft pencil e.g. B series – 2b, 3b, 4b, 5b, 6b, 7b, etc.

(b)   Hard pencil – these are types of pencils used in drawing, most especially on hard surfaces, plywood, hardwood, cardboard, etc. e.g. H, and HB of different grades.

(ii)   Lettering pens
(iii)   Drawing board
(iv)   T – Square
(v)   Donkey chair (usually used in the studio)
(vi)   A Triangle
(vii)   Metal rule
(viii) Thumb pins
(ix)   Drawing ink
(x)   Drawing paper
(xi)   Tempo markers etc.

3.2   Lettering Production (Techniques)

There are different techniques in lettering construction and production. Let us discuss some of them:

(i)   Grid Technique

This is an effective way of enlarging letters or images such that all parts of the letter / image remain proportional to the original letter. With this method, small letters can be enlarged.

The procedures involved are:

(a)   Mounting the letters/images to be enlarged on a sheet of paper. Use tracing paper to lift the letters/images;
(b)   Draw grid or square lines across the letters/images to be enlarged, number the gridlines vertically and horizontally;
(c)   Determine the size of magnification or enlargement to be used. It could be twice, thrice, or six times of the original size;
(d)   Prepare the surface clipboard or paper on which you want the image transferred. The size of the square will be determined by the size and complexity of the letter or image;
(e)   For the enlargement, mark off the surface on which you want the image transferred with the same number of enlarged squares. For example, if the letter is to be five times the original letter, the enlarged squares should be five times as large;
(f)   Then, draw the outline of the letter or image in the corresponding larger square at a time;
(g)   Use tempo marker or dark pencil to shade the letter at the end of the transfer; and
(h)   Clean off the grid or square lines thereafter.

(ii)   Projection Technique

This is used where a big display type is required. The object to be enlarged is inserted into the machine or projector (opaque, overhead, slide, enlarger, etc.).

Paste the surface on which the image or letter is to be transferred on the wall or floor. Make sure it is tight to prevent movement. Focus clearly the image to ensure the desired clarity after obtaining the required size.

Trace the outline of the projected letter with pencil. Use ruler for straight lines of the letter or diagram.

Remove from the floor or wall and trace out boldly before completing it as desired.

(iii)   Stenciling

The technique involves the use of stencils which are usually metals, plastics and paper. They come under different trade mark names such as Oxford and Templates. Stencils are "templates" indicating "letters" or "figures" or "symbols".

Place the desired letter or the alphabet in the desired surface and trace out by means of pencils, paint brush, felt pens, tempo markers or crayons.
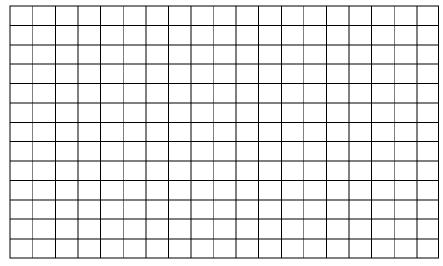
(iv)   Sticking

There are custom-made or commercially produced letters popularly known as lettra sets. They come in different sizes, colours, and type faces. The only thing to do is to transfer your object, image or letter into the desired surface by rubbing on the letters which eventually stick to the prepared surface.

(v)   Dry transfer

Dry transfer is known as rub-on, press-on or transfer type. It is about the most modern technique. The letters usually come in different sizes, faces and colours. The letters (made up of carbon and wax) are printed on a plastic acetate or polyethylene carrier sheets. The letters can be transferred to any dry surface such as paper, glass, metal or wood by rubbing with the aid of a dull pencil or used ball point pen.

(vi)　Letter guide lettering system

WORKING SPACE

(grid table — working space)

3.3　The Place of Lettering in Media Production

Lettering is an essential aspect of visual media which conveys the written message. Apart from a few exceptions, practically all visual media such as graphs, charts, posters, map, transparencies, etc. require either lettering or printing in form of titles, captions, labeling, and footnotes. Thus, lettering is an indispensable topic to everyone engaged in visual communication particularly the teachers. Lettering helps to identify, label, emphasise, explain, clarify and reinforce, and often they are used to add supplementary information. Lettering aids in reading and writing. It comes in words and sentence forms.

4.0　CONCLUSION

Lettering is an art of writing and constructing letters of the alphabet from A – Z. This unit discusses the types of lettering which are basically blocks and scripts. These are further subdivided into Gothics, Romans and Italics and Text respectively.

Lettering is an aspect of visual media which are used to convey written information and messages. This could be on media such as charts, graphics, posters, maps, transparencies, etc. The way you write speaks a lot about you. There is therefore the need for you to encourage your students to write legibly and neatly. Practice should be encouraged on the part of the students. Lettering helps to identify, label, emphasise, explain, clarify and entertain.

5.0   SUMMARY

Lettering helps to identify, label, emphasise, explain, clarify, notify, in fields of human communication.

6.0   TUTOR-MARKED ASSIGNMENT

1. Define the word lettering and give two types of lettering.
2. Using lower case letter, write the sentence "God is Able".
3. Using Gothic (upper case letter), write the sentence "If God does not build the house…."
4. List and explain three qualities of lettering.

7.0   REFERENCES/FURTHER READING

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UNIT 4   PRODUCTION OF AUDIO MEDIA

CONTENTS

1.0   INTRODUCTION

The production and utilisation of audio media is not strange to a trained teacher. Apart from previous experience with audio media at home, their utilisation for teaching-learning process is not new. Audio media may either stand alone or be used as a component of the audiovisuals.

Audio media can be grouped into these categories:

(1)   Records / record players
(2)   Magnetic tape with tape recorders
(3)   Compact disc (CD) with compact disc player
(4)   Radio programmes or educational broadcast on radio.

The methods of production and operations can be learnt with ease due to the fact that audio equipment are common place gadgets and are readily available.

Audio media can be referred to as the resources used in education which produce sound that convey information and stimulate the audience's imagination. This audio media prompts the audience to conjure up mental images of time, event and place from just a few audio clues with no picture attached at all. Audio media can be defined as instructional materials that, by design, appeal to the sense of hearing.

2.0   OBJECTIVES

At the end of this unit, you should be able to:

- list and explain four of the forms of audio media
- name five different categories of script writing
- state in a systematic order the procedure for recording
- mention and discuss exhaustively two different ways of utilising audio media.

3.0   MAIN CONTENT

3.1   Forms of Audio Media

As you can see from the introductory aspect of this unit, there are four basic forms of audio media. They include:

(1)   Records and record players
(2)   Magnetic tape and tape player / recorder
(3)   Compact disc and compact disc player
(4)   Radio programme or educational broadcast.

Records and Record Players

This equipment has been phased out and has been replaced with modern ones as a result of the recent technological advancement. The use of phonogram or gramophone records is therefore no more popular with schools as they used to be. The advent of the magnetic tape recording was the first invention that began to shut its doors. However, some of them still serve as a reference point for educational purposes especially as precedence to the more modern types.

The record players are of different types.   The phonogram or gramophone is now replaced by modern turntables (record players). These modern record players are capable of stereophonic production. A stereophonic sound production is one in which the sounds of different instruments are separated and heard by a listener.

3.1.1 Peculiarity of the uses of Records

Records are best used for the teaching-learning of:

(a)   new vocabulary
(b)   music (song / instrumentation)
(c)   aural comprehension
(d)   vocal selection.

Magnetic Tape and Tape Player / Recorder

The tape recorder is mainly a machine used for recording and reproducing sounds electronically, it has two iron oxide coated tape. During recording, sound waves generate electric impulses which create magnetic patterns on the side of the tape with iron oxide coating and the recording gets fixed to it immediately. Special processing is not required and the ease of operation has made the tape recorder very popular since it came onto the scene. Tape recorder is cheap compared with the older forms used as teaching resources such as film or the multimedia. Not only that it is simple to operate, it equally has provision for the use of battery if the supply of electricity fails.

Compact Disc (CD) and Compact Disc Player

This share nearly the same attributes with the record player except that in size the compact discs are smaller than record players. It is a more recent development and has provision for electronic and optical effects. Its technological package has been so utilitarian and user-friendly. Computer systems use CD player.

Radio / Educational Broadcast

Educational radio broadcasts constitute a set of resources readily available to you as teachers for use in the schools. All you need is any type of radio set for receiving the programmes. You may need the tape recorder for recording and preserving the radio programmes or broadcasts for use on other occasions.

Learners stand the benefit of being taught by skilled and expert teachers. So, radio broadcasts help teachers in the field where they find themselves comparatively ignorant and inexperienced.

Today, educational radio programmes cater for institutions ranging from nursery/primary to the university level. Broadcast by the Federal Radio Corporation of Nigeria (FRCN) and National Open University of Nigeria (NOUN) are examples of educational broadcasts.

3.2   Script Writing

Radio programmes can be grouped into different types on the basis of their script formats:

(1)   straight talk
(2)   documentary
(3)   interview

(4)   panel discussion
(5)   live events
(6)   discussion forum
(7)   dramatisation
(8)   quiz sessions.

A script writer begins by identifying:

(1)   Objectives of the programme
(2)   Considering the level of understanding of the audience
(3)   Outlining the content
(4)   Deciding on the format of presentation.

The fact that a radio script is to be spoken demands that the script be prepared to reflect the intended usage and not as written English. The tone should be conversational and casual and not formal since it is not a piece of literature, but a piece of spoken information with some degree of entertainment and live put into it. It should flow like a story and should accomplish a theme. Some characteristics of a good radio script are as presented:

(a)   Ease of comprehension
(b)   Precision
(c)   Planned repetition
(d)   Sense of humour
(e)   Sound effects
(f)   Variety
(g)   Assignment on Radio script writing.

3.3   Recording Procedure

Audio recording of information needs planning. Information such as introduction and review or narration are relatively very simple. The steps required in planning and production are as follows:

- Identify the purpose and general objectives of such a presentation
- Consider the audience profile i.e. age group, interest, motivation, etc
- Decide the strategy i.e. type of presentation, number of voices, background information, etc.
- Prepare a content outline
- Develop a script with desired sequences, characters and the message for the content outlined
- Identify the presenters and interact with them, organise the records

- Arrange the audio recording in a studio or otherwise, as appropriate
- Edit the audiotape by selecting, arranging, mixing voices and background noise
- Prepare a short note on the content of the audio recording and package it in a suitable format.

3.4   Utilisation of Audio/Media

Instructional recording are of two types:

- for group listening and discussions
- for individual self-paced learning.

Recording for group learning is similar to that for information recording. Recording for self-paced learning should take account of individual differences, provision for replays; time to think and respond to or carry out an activity, also there must be a plan for feedback. Such audio recordings have three alternative instructional formats:

- audio notebook
- audio tutorial
- audio vision.

The audio notebook may consist of a study guide plus a workbook or it may be in two separate worksheets to accompany the audio cassette. The audio cassette or the study guide introduces the topic and then audio cassette describes the content and periodically directs the learner to the activities in the workshop. The workbook includes:

- questions for the audience
- exercises to be worked on
- objective items, and
- numerical problems.

Answers and discussions are provided on the audio cassette. The study guide contains supplementary reading material and references.

The audio tutorial (AT) system uses audio cassette to conduct the tutorial. It provides an introduction, information, instruction and also directs the learner to undertake various learning activities. There is no study guide and sometimes no workbook either. It relies upon existing books, journals, paper and pencil as also in other activities.

The audio vision format developed by British Broadcasting Corporation (BBC), consists of audio from the cassette recorder and visuals presented in the form of still-picture strips, numbered photographs, charts, slides, models, etc. It was used in educational institutions as a substitute for educational television. This package is an economical, attention-catching, motivational and convenient format of employed audio recordings.

4.0 CONCLUSION

Audio recordings can be a very interesting, cost-effective and simple means of self-learning.

5.0 SUMMARY

The production of audio media has been described in a simple and straight forward way to encourage you to try it out. Audio media as established from the foregoing can take the form of radio broadcast, record players, tape recorder and the recently produced compact disc and player.

Radio broadcasts can be used to reach out to people living in remote places. This is why different means of employing audio cassettes, with audio notebooks, audio-tutorial and audio vision are being explored because of their advantages in distance learning and open learning. More so, the feedback process is easy to attain.

6.0 TUTOR-MARKED ASSIGNMENT

1. What are the purposes of audio recording?
2. State two formats of instructional audio recording.
3. State the steps needed to plan and produce an effective audio recording for teaching.
4. Mention three formats of radio programme.
5. Differentiate between the audio records for information and for instruction.
6. What are the characteristics of a good radio script?

7.0 REFERENCES/FURTHER READING

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NTI / DLS Module.

UNIT 5   PRODUCTION OF VISUAL AND AUDIO VISUAL MEDIA

CONTENTS

1.0   INTRODUCTION

In the conventional educational system, classroom is rather formal and teacher-centred. The sole responsibility for selecting appropriate instructional materials also rests on the teacher. However, the teacher needs to produce his or her materials that are required for teaching. Apart from knowing what to produce, the teacher must be familiar with the materials and facilities that are used before production can take place.

2.0   OBJECTIVES

At the end of this unit, you should be able to:

- define the terms visual and audio media
- give detailed analysis of visual media and audio media
- list the basic principles of media production
- describe the procedure for utilising media
- explain steps in producing audio visual media.

3.0   MAIN CONTENT

3.1   Forms of Visual Media

Visual media are materials that appeal to the sense of sight and are subdivided into two namely: projected and non-projected visuals. Projected visuals require light source for projection. Examples are Cine (film) projector, episcope, overhead projector, slides projector, micro projection, etc. The non-projected visuals do not require light source. They include three- dimensional objects like chalkboard, display boards, marker boards, models, diorama, realia, puppets, etc. Two-dimensional objects have length and breadth while three-dimensional objects have length, breadth and height. They are regarded as object in the 'round.'

3.2   General Principles of Visual Media Production

(i)   **Select specific instructional objectives**

The objectives of the instruction for which material will be used may be learners' acquisition of skills, knowledge, competencies or desirable behaviours in learning tasks like rhyme and rhythm in poetry, reading techniques in language arts, etc.

If a teacher wants to produce a chart, he must have it in mind as to what skills, knowledge or even attitude the chart will be used to evoke so that the learners will be able to achieve them. Similarly, the kind of chart to produce must be clearly stated.

(ii)   **Identify the characteristics of the learners for whom the materials will be used**

The producer collects vital information about the need, interest, background, experiences, instructional strength and weakness of the learners.

This information will guide the producer in the selection of the content of the message, the method of presentation, the amount of information to be presented, and the media needed to carry the message.

(iii)   **Select the content of the message that the materials will carry**

The content should challenge and interest learners, but should also be easy to understand.

(iv)   **Select the medium for presenting the message**

The visual media which the producer chooses should be the most suitable for the message and for the achievement of the learning objectives already stated.

(v)   **Determine the cost**

The cost of producing visual materials like textbooks, workbooks, films, teachers' manual will be substantial. However, the cost of producing the simple materials like posters, charts, boards, etc. may be minimal.

(vi)   **Produce the materials in conformity with the rules**

Produce the materials by observing the rule of clarity, legibility, simplicity, accuracy, durability and portability.

(vii)   **Test the materials for effectiveness**

A producer needs to try out the materials to determine the instructional effectiveness of such materials. Feedback is also very necessary in any meaningful production so that adjustment can be made where necessary.

3.3   Samples of Visual Media (Graphics)

Visual media, as said earlier, are materials that appeal to the sense of sight only. The examples of visual media (graphics) are diagrams, charts, graphs, pictures, posters, maps, globes, displays, educational boards, etc.

Types of Charts

There are many types of charts, namely: text charts, pie chart, bar chart, flip chart etc.

Text Charts – These are used primarily to display word, and can also display numbers and other characters. They are title, bullet, table and organisation.

Pie chart – also used to represent data and information for comparative purpose.

Bar chart – are used to represent data.

Flip chart – etc.

3.4   Utilisation of Visual Media

The general basic principles for utilising visual media are as follows:

(i)   **Prepare yourself as teacher** – You must prepare yourself for the use of visual media in case of unexpected challenges that may come up in the course of utilisation. It is important that you preview, sort through and examine closely the visual media. Plan what you and the students will do with it during and after using it.

(ii)   **Check the environment** – Teacher must ensure that the environment is conducive for learning before using the media. Check the sitting arrangement, ventilation and other extraneous factors before using it.

(iii)   **Prepare the class** – The material should be introduced and objective for its use should be made clear to learners. Describe what it covers and what is to be learnt from it. Tell the learners what they will do after the lesson.

(iv)   **Use the media** – You must ensure effective and judicious use of visual media by displaying them properly as at when due. The visual media can be used at the beginning of the lesson for introducing a topic. It can be used at the middle to illustrate the topic and it can also be used at the end of the lesson to summarise the topic. It is advisable to keep the media aside to avoid destruction when they are not in use.

(v)   **Follow-up** – After using the visual media, ask questions from the learners to ensure achievement of the stated objectives. You must give room for learners' discussion and give assignment and test for feedback on the success or failure of the lesson.

3.5   Steps in the Production of Audio Visual Media (Tele-Scriptwriting)

Television is considered the most powerful audio-visual media, and it has revolutionised lives of many people in the world. It also has potential to remarkably affect lives.

Consequently, tele-scriptwriting is one of the factors responsible for success or failure of television. Besides the attributes of electronic motion, picture, sound effect and script provide the basic structure of the whole programme. It is a kind of map, a blueprint of what is going to be in the TV programme.

Writing a script on a given topic differs from one to another and treatment of the topic varies from person to person.

Basic features in all scripts

(1)   **Kind of audience:** The script writer must know the age group, socio-cultural background and psychological profile of audience to whom the programme is going to be addressed.

       The interest, attitudes and inclinations are to be taken into account. Homogeneity or heterogeneity, rural or urban nature, industrial or agricultural culture of audience are very important considerations to be made.

(2)   **Objectives of the programme:** Besides the general objectives of its use like entertainment, specific objectives have to be determined. For example, an educational TV programme is spelt out in terms of learning outcomes and an adult programme is expected to achieve objectives centred on citizenship or family planning.

(3)   **Genuineness of information of facts:** The scriptwriter is required to make use of various resources like books, charts, graphs, pictures, film clips etc. to prepare scripts on different topics. The collected data should be systematically arranged.

(4)   **Treatment of topics:** After collecting and arranging data, the scriptwriter has to make all attempts for presentation of the topic in an attractive and effective manner. S/he must think of such audio-visual aids as are available and suitable for the job.

(5)   **Format of the programme:** A programme may be prepared in various formats – drama, feature, discussion using graphics, animation, and so on. Limitations are imposed by the needs of the TV studio, funds available and personnel. The scriptwriter should therefore use available resources in the most effective way.

(6)   **Script as visual medium:** The scriptwriter should not forget that TV is a visual medium; its importance lies in visuals and not only in words. Vision and sound should go together and in a very balanced manner, complementing each other. The writer of TV script should think of his topic in terms of telling a story in series of pictures.

3.5.1 Writing TV Script

The writer of TV scripts having considered his audience with their various background, his objectives and peculiarities of the medium, should arrange his content along with visuals to make the programme effective as well as interesting. He should visualise the sequences of the

entire programme with the help of a storyboard and a series of drawings with accompanying notes as to the proposed commentary.

Guidelines for TV Scriptwriting

(1)   The script must be simple, direct and personal
(2)   It must be written with a full knowledge and involvement of programme visuals
(3)   The presenter's style and personality should be taken into account
(4)   It must stress and recapitulate its salient points
(5)   It should involve and address the audience directly
(6)   It should have variety of pace and rhythm and give occasional "breathing space", especially in the middle of the programme
(7)   It should not attempt to say too much in the time available
(8)   It should suggest the suitable visuals, sound effects, etc. along with the commentary
(9)   It must note the demands of the electronic studio with its facilities as well as limitations.

4.0   CONCLUSION

Production of visual and audiovisual media materials is an important aspect of the application of Educational Technology to improve the quality of instruction in the classroom. However, the teacher should know how to produce visual and audiovisual materials; bearing in mind the principles and guidelines necessary for the production feature and steps of TV scriptwriting.

Apart from knowing what to produce, the teacher must be familiar with the materials and facilities that are used before any meaningful presentation can take place.

Consequently, the educational administrators in the schools, ministries and the stakeholders should encourage teachers to produce media materials by providing them with necessary facilities needed.

5.0   SUMMARY

Media refer to those things which are manipulated, seen, heard, or talked about plus the instrument which facilitates such activity. Aspect of media are visual which appeal to the sense of sight; examples are posters, charts, drawings, models, projector, specimen, etc. and audiovisual which appeal to the sense of both sight and hearing; examples are television, computer, closed circuit television, etc.

Generally, media can widen their knowledge, diversify teachers' method, stimulate learners' interest, used to enhance effective communication, and teach thousands of students at the same time in different geographical locations. Media could be produced following the basic principles and procedures. Through the use of media, education can become more productive, more scientific, more concrete, real and immediate.

6.0   TUTOR-MARKED ASSIGNMENT

1.   (a)   What are educational media?
      (b)   Distinguish between visual media and audiovisual media.
2.   Discuss the importance of media in teaching-learning process.
3.   (a)   List three basic principles of media production.
      (b)   Explain four major features of a script.
4.   State five guidelines for writing TV script.

7.0   REFERENCES/FURTHER READING

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UNIT 6   PHOTOGRAPHY

CONTENTS

1.0   Introduction
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3.0   Main Content
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        3.2   Types of Cameras and Films
        3.3   Parts of a Camera
        3.4   Steps in Taking Photographs
        3.5   Common Types of Shot
        3.6   Rules of Photography in Teaching-Learning Process
4.0   Conclusion
5.0   Summary
6.0   Tutor-Marked Assignment
7.0   References/Further Reading

1.0   INTRODUCTION

Photography was derived from two Greek words: 'photo' meaning light and 'graphy' – writing. It therefore involves light and writing (images and film). Photograph depicts reality; once it is produced, it takes on reality. Thus, the photographer creates a visual image that forces us to see his view, his translation of a small part of the real world. Photography is not only an art, but a process of producing images through craftsmanship. Therefore, photograph is a visual means of communication. It records past, present and future events. It is a way of writing with light. It is a medium of expression that tells a story exactly as it really is. Abimbade (1997) defines photography as "a visual communication that is, a form of language that is visible, a medium of communication, a method of recording events and conveying messages; a system of making known one's viewpoints, ideas and opinions about reality.

2.0   OBJECTIVES

At the end of this unit, you should be able to:

- list five different types of cameras
- mention ten parts of a camera
- name and explain three steps that are involved in photography
- list and explain six different types of shots.

3.0 MAIN CONTENT

3.1   Purpose of Photography

Photography can serve certain purposes as in utilitarian and inspirational. For utilitarian purpose, it is designed to report on things and conveys information about a place, orientation, or personality identification. Sophisticated aspects of the utilitarian purpose in photography would involve accurate recording of events and objects in science, in engineering, in medicine, in architecture, in fine arts, etc. Thus, photograph can be used to record history.

Inspirational purpose of photography is intended to create aesthetic and creative stimulation; it is also a language or medium of communication.

Photography can always educate and be used for expressing the works of art. It provides self-expression and gives pleasure/simulation to the artist and the audience. It supplies a representation, and interpretation, or a criticism of life. The possibility of measuring the vividness, accuracy and the immediacy with which experience is communicated can be done through the use of photographs.

3.2   Types of Cameras and Films

The basic differences among available cameras are:

(i)   shutter speed
(ii)   lens aperture
(iii)   degree of automation
(iv)   size of film used.

Having established the basic differences common in cameras, it is also necessary to preview different camera types by film format. The types include:

(a)   ***110-Film Cameras:*** These are pocket Instamatic Cameras that Kodak introduced in 1972. The film comes in a drop-in cartridge, which can be used in any camera specifically designed to accept this type of film. The rectangular negative size of 13mm x 17mm is about one-third of the square 126 format.
(b)   ***126 Cameras:*** These are the first instant types with a negative size large enough for a standard print and projectable colour slides in standard two-inch cardboard mounts. It uses square 28mm x 28mm. New generations or contaflex cameras have come into the market, thus it is no longer commonly found in the market.

(c)   *35mm Cameras:* These have the advantages of shooting a longer series of pictures on a short strip of film previously used only in motion picture cameras. For many years, 35mm cameras have been the most widely used cameras with the widest choice of film emulsions and the widest availability of generally dependable processing. They are available as range finder cameras, single-lens, reflexes, stereo cameras and a diversity of simple automotive types.

(d)   *2¼ x 2¼ Cameras:* These larger square-format roll film types include the twin lens reflex and single lens reflexes.

(e)   *4 x 5 Cameras:* These formats apply to press and view cameras, which use sheet film, roll film and film packs.

(f)   *The Reflex Cameras:* Cameras with range finders are reflex cameras. For instance, 35mm camera can be equipped with range finder for focusing the lens, whereas others actually focuses the image projected by the lens – these are the single-lens reflex type that produces negatives ranging in size from ¾ - 5 by 7 inches.

(g)   *Instant-picture Cameras:* These are mainly the very expensive Polaroid group. They do not use standard films, and the print sizes vary from a square print under 2" to a 3¼ x 4¼ print. The earliest models were for black and white only, but we have them in colour in present times.

(h)   *Polaroid Instant Picture Cameras:* The cameras often reminiscent of the "folding camera" include a wide choice of models and individual capabilities. Some have a built-in flash system to control the light of the flash cube. Others have a built-in timer to signal when the print is fully developed.

(i)   *Special wide angle Cameras:* These cameras have sizes ranging from 35mm to 4 x 5 and are designed for limited use. They have fixed lenses intended for special occasions.

(j)   *Video Cameras:* Sequel to a high level of technological know-how, video cameras which used cassette tapes for audio-visual purposes are commonly used in contemporary times.

(k)   *Digital Cameras:* These are modern and highly sophisticated cameras which make use of memory card instead of the common film. They are very powerful and have electronic / optical effects which could be used to influence their product to the taste of the handler. The output would have been first previewed before finally snapped. If dissatisfied, it can be wiped off, re-snapped and so on. They also share the potentials of being connected to the computer systems for preview and production of hard copies.

3.3   Parts of Camera

The following are the parts of a camera:

(i)   Film exposure counter
(ii)   Shutter release
(iii)   Shutter-speed dial
(iv)   Film advance lever
(v)   Diaphragm ring (f/stop)
(vi)   Depth of field scale
(vii)   Distance scale
(viii)   Focusing ring
(ix)   Lens
(x)   Rewind knob
(xi)   Flash terminals
(xii)   Back lock
(xiii)   View finder
(xiv)   Focal plane shutter
(xv)   Film cassette chamber
(xvi)   Tripod head attached to tripod socket
(xvii)   Film pressure plate
(xviii) Film perforation sprockets
(xix)   Film take-up spool
(xx)   Film-rewind release button.

3.4   Steps in Taking Photographs

It is good for us to discuss those basic steps which are needed to be taken before having a photograph. There are three basic steps in the following order:

a.   loading
b.   focusing
c.   shooting

Loading

It is expedient to strictly follow the manual of instruction that accompany a new camera for loading the film into the camera. A camera should be loaded under subdued light (preferably in a dark room). For instance, the following steps should be taken in loading a 35mm camera that is regarded as the most available in the market.

• Open the back cover of the film, lift up the film rewind roll and pull it put. This will help to open the back cover and set the exposure counter to 'S' (start). Insert the roll of film into the

space and push down the film rewind knob. Hold the spool slot and wind the film a little forward with the advance lever. Make sure that the sprocket holes on the edge of the negative are interlocked in the sprocket teeth. Close the back cover of your camera, wind the film forward and press the shutter release until the arrow or line indicating the beginning of the first exposure is reached.

•   Ensure that the film speed of the film you are using is set after loading. You press down film speed setting of the lever.

Focusing

The photographer focuses a lens on a given object, at a given distance, to control the light that reaches the focal plane and to ensure the formation of a sharp and distinct image on the film. To achieve proper focus, the distance between the lens and film must be correct and the distance between the photographer and object in focus must be correct.

Factors affecting sharpness of focus:

1.   Diameter of the image as formed by a given lens
2.   Perspective (how objects are perceived in terms of dimensions)
3.   Depth of field (distance of object from the lens, the size of the aperture and the focal length of the lens)
4.   A distance zone for scenery.

Shooting

Shooting is done by pressing the shutter i.e. by releasing button on the camera. This action gives a click sound, indicating that a shot has been taken. Every shot means that one of the film exposures has been used up and another moved into position through winding.

3.5   Common Types of Shot

The following are typical examples of common terminologies in photography:

(1)   Close-Up (CU): A shot that emphasises a detail. The placement of camera will be so close to the object in order to dominate the whole show.
(2)   Close-Shot (CS): Shows a character from the shoulders up and includes some background detail. This should not be confused with close-up.

(3)   Medium Shot (MS): Shows one or more persons, as in medium group shot. The shot is usually waist high and up.
(4)   Long Shot (LS): This is the next shot after the medium shot. It includes the entire body or bodies and more detail of the scene. It is also used to reveal a wide area or a far distance.
(5)   Extreme Long Shot (XLS): This encompasses considerable distance but without definition.
(6)   Wide Angle (WA): A variation on the long shot in which special camera lens is used. It includes more on the sides than an ordinary shot, e.g. in an amphi – theatre.
(7)   Zoom: The camera pulls rapidly forward, enlarging the subject.
(8)   Tily Shot (TS): The camera can tilt up or down, giving emphasis to a certain object in the scene. Examples, tilt-up to a figure on a cliff top; tilt down to muddy shoe.
(9)   Aerial Shot (AS): This is the type of shot used if necessary to indicate a shot taken from a plane looking down on the scene.

3.6   Rules of Photograph in Teaching-Learning Process

Photograph is so important in the teaching-learning process for the following reasons:

(i)   It serves as reference materials
(ii)   It serves as instructional materials for teaching-learning activity
(iii)   It helps us to see the developmental stages of a society and an individual
(iv)   It is good for record purposes
(v)   For advertisement purposes
(vi)   It serves as attestation material.

Some terminologies used in Photography

Cassette:	Light tight container for 35mm camera film.
Continuous Tone:	Containing a range of tones between dark and light, such as a conventional photograph.
Density:	The darkness or depth of tone of a photographer.
Depth of Field:	Distance between the nearest and farthest points in the subject that are in focus.
Enlarger:	Optical projector to give enlarged (or reduced) size image which can be exposed on a light-sensitive film or paper.
Forging:	Allowing white light to strike light sensitive material as in opening the back of a loaded camera or a box of enlarging paper in white light.
Focal Length:	Distance between lens and position of sharp image for a subject of a great distance away.

Macro Lens: Specially designed lens for close-up work.
Panchromatic Film: A black/white film which is sensitive to all visible colours should be processed in total darkness.
Positive Film: 35mm black/white film useful for making black/white slides for negatives.
Roll Film: Photographic film usually 2½ inches wide (known as 120 or 620).
S.L.R: Single Lens Reflex.
Safelight: Light sensitive chemicals found in photographic film and paper.

4.0   CONCLUSION

The type of the camera available determines the type of the film you will buy for its use. A topic on photography is interesting and practicable. The role of photograph in teaching-learning process cannot be over-emphasised.

5.0   SUMMARY

From the foregoing, we could see that photography is a medium of communication. It is also an art which serves a lot of purposes with reference to the teaching of history and education generally. Different types of cameras and films like 35mm cameras, 126 mm cameras, digital cameras, reflex cameras have been highlighted.

Parts of a camera like shutter release, film advance leaver, lens, view finder and more have been listed. Loading, focusing and shooting are the three steps to be taken in photography and the common types of shot have been carefully outlined and discussed.

6.0   TUTOR-MARKED ASSIGNMENT

1.   Photography is a record of events. Justify this statement.
2.   Name the two recent types of cameras and state the advantages they have over older types.
3.   Mention and explain five main parts of a camera.
4.   Write short notes on any five of the following terms:
      (i)   focusing
      (ii)   loading
      (iii)   tily shot
      (iv)   aerial shot
      (v)   long shot
      (vi)   depth field
      (vii)   panchromatic film
      (viii) forging.

7.0   REFERENCES/FURTHER READING

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