STUDY GUIDE

ON

EDUCATIONAL TECHNOLOGY

M.A.(EDUCATION)/M.ED.

COURSE CODE 834 **UNITS: 1-9**

DISTANCE & NON-FORMAL EDUCATION DEPARTMENT
ALLAMA IQBAL OPEN UNIVERSITY, ISLAMABAD
APRIL, 1998

1st Edition	1998
2nd Printing	2001
3rd Printing	2004
No. of Copies	10000
Price	Rs. 100/-
Publisher	Allama Iqbal Open University, Islamabad
Printed at:	786 Printers, Islamabad

COURSE TEAM

Chairman — Dr. Muhammad Rashid
Dean, Faculty of Education, AIOU, Islamabad.

Members

1. Professor Laeeq Ahmed Khan,
   Consultant, Prime Minister's
   Literacy Commission, Islamabad.
2. Dr. Prof. Mrs. Munawar Mirza.
   Director, I.E.R.
   Punjab University, Lahore.
3. Dr. S.M. Anwar Hussain.
   Director, A.V. communication.
   NARC, Chak Shahzad, Islamabad.
4. Mr. Amar Jalil Qazi,
   Consultant, Teacher Education Project.
   Curriculum Wing, M/O Education,
   H-9, Islamabad.
5. Dr. Mrs. Mussaret Anwar Sh.
   Chairman, Teacher Education Deptt.
   AIOU, Islamabad.
6. Dr. Muhammad Iqbal Ch.
   Consultant, Teacher Education Project,
   Curriculum Wing, M/O Education,
   H-9, Islamabad.
7. Dr. Zulkaif Ahmed,
   Chairman, Department of EPM,
   AIOU, Islamabad.
8. Mr.Mahmood Hussain Awan,
   Incharge, Department of Special Education,
   AIOU, Islamabad.
9. Mr. Muhammad Javed Iqbal,
   Assistant Professor,
   Distance & Non-Formal Education Deptt:
   AIOU, Islamabad.

- Course Development Coordinator — Dr. Muhammad Rashid
- Editor
- Reviewer — V.A. Prof. Dr. Muhammad Shafi

Course Coordinator — Dr. Muhammad Rashid

FOREWORD

Communication technology is fast changing due to the scientific advancement in the country. Even books have been changed into small micro films and once can study the same in the library in the advanced countries in the world. Classroom interaction in Pakistan also needs a rapid change. The use of Audio-Visual aids in the classroom situations can make the lesson interesting, comprehensive and dynamic. These aids keep the students attentive and actively engaged in the flow of lesson. They help in teaching and learning in an effective way. They also keep the interest of the students always alive in the class as the students participate in the lesson actively.

Pakistan is entering into an age of technology--not just industrial era in big way. Computer and satellite television are its visible symbols. But the essential change has to take place in the thinking process, in information or communication process and consequently in the problem solving process.

This change must affect our education--teaching-learning process as well as related decision making in educational administration. Towards this purpose, educationists shall have to use the new technology. Systematic efforts shall have to be undertaken to acquaint our teachers, students and parents with the changes in educational technology and their implications.

I congratulate Dr. Muhammad Rashid, Dean, Faculty of Education and Course Coordinator for completing the study guide to be offered on time. Any suggestions/comments for improvement of the course will be welcome.

(Dr. Anwar Hussain Siddiqui)
Vice-chancellor
April, 1998

ACKNOWLEDGEMENTS

The Allama Iqbal Open University and the author is grateful to all scholars nationally and internationally and the publishers of various reports and journals whose works were used as reference materials in this course. The quotations used from their works gratefully acknowledged. It may be pointed out for general information of all whose work has been quoted in the course that the Allama Iqbal Open University is a non-commercial educational institution which provides educational facilities to under-privileged remote rural areas through its distance education method.

I am grateful to Dr. Anwar Hussain Siddiqui, Vice-Chanceller, Allama Iqbal Open University for providing facilities and encouragement for writing the study guide.

The Allama Iqbal Open University and the author is grateful to all the members of course team for giving their comments to improve the outline and providing materials on educational technology.

Moreover, the University and the author would like to gratefully acknowledge the assistance of Dr. Muhammad Shafi, visiting Associate Professor of Ghulam Ishaq Khan Institute of Technology, Topi, District Sawabi who reviewed this course and provided feedback and fresh ideas concerning its development.

The help, provided by Mr. Salman Masood, Sheikh Hafeez-ur-Rahman for editing the course and of Mr. Javed Iaqbal and Mr. Liquat Ali Goraha for proof reading, is highly acknowledged. Special thanks are due to Dr. M. Daud Awan, Mrs. Arifa Salman, Mr. Amjid Ali and Dr. M. Aslam Asghar for their assistance in the development of the course.

Finally, I am thankful to all, who helped in developing of the course. I am also indebted to Mr. Intizar Hussain, Mr. Sohail Anjum and Mr. Ghulam Mohyuddin for typing, retyping so many times in order to finalizing/completing the course on time.

(DR. MUHAMMAD RASHID)
DEAN/COURSE COORDINATOR

CONTENTS

UNIT-5 INSTRUCTIONAL MEDIA

COURSE INTRODUCTION

Educational Technology is a new concept in the discipline of education. It is made up of two words Education and Technology. It can simply be defined as application of science and technology to the field of education.

Educational technology implies a behavioural science approach to teaching and learning in that it makes use of pertinent scientific and technological methods and concepts developed in psychology, sociology, communications, linguistics and other related fields. It also attempts to incorporate the management principles of cost effectiveness and the efficient deployment and use of available resources in men and materials. Educational technology as a concept does not necessarily imply the use of machines and other items of hardware.

In short educational technology, in its wide sense as understood today, includes the development, application and evaluation of systems, techniques and aids in the field of learning. As such its scope encompasses educational objectives, media and their characteristics, criteria for selection of media and resources, management of resources, as well as their evaluation.

Another noticeable trend is the creation of multi-media learning environments in the classroom which involve the use of a variety of interrelated learning experiences. This implies the selection and use of appropriate sequences of inter-linked Audio Visual or instructional media learning experiences which reinforce and strengthen one another in furthering the progress the learner.

Finally, educational technology is an applied or practical study which aims at maximising educational effect by 'controlling such relevant facts as educational purposes' educational content, teaching materials, methods, educational environment, conduct of students, behaviour of instructors and inter relation between students and instructors.

Leaving aside, the discussion on the definition of educational technology, the effectiveness of audio visual aids, role of educational technology in learning, effort has been made to highlight the role of educational technology in learning, developing educational objectives, theories of instruction and the role of instructional media in Units 1-5. The role of communication and selection of media for effective learning has been discussed in Unit No.6. Planning and

Producing of instructional material, organization and management of educational media and new trends in educational technology such as computers in education, satellite system, teleconferences and interactive video have been discussed in Units 7-9.

However, the course in meant to remain open-ended. Any criticism, suggestions of improvements will be welcome. The course will be revised after some time and all suggestions/ recommendations/improvements be incorporated.

(DR. MUHAMMAD RASHID)
DEAN/PROFESSOR
COURSE COORDINATOR

Objective of the Course

Hopefully, on the completion of the course, the student will be able to:-

1. Explain the term Educational Technology.
2. Discuss the nature of Educational Technology.
3. State the need of Educational Technology.
4. Specify the scope of Educational Technology.
5. Appreciate the changing concept of Education.
6. Define the term learning.
7. Discuss various theories of learning.
8. Evaluate educational implications of theories of learning.
9. Explain the process of learning.
10. Specify the role of teacher in learning.
11. Distinguish between aims, goals and objectives.
12. Explain the characteristics of objectives.
13. Recognize and discriminate between Cognitive, Affective and Psychomotor objectives.
14. State what words should be used and what words should be avoided while writing the objectives.
15. Discuss on how to write objectives in behavioural terms.
16. Develop a student learning profile.
17. Discuss instructional strategies.

18. Explain the techniques of motivation in the instructional process.

19. Identify the instructional processes for motivation.

20. Differentiate the individual instruction, group instruction, simulated instruction and inter-active instruction.

21. Explain the graphic aids, like Maps, pictures, charts, graphs, globes and diagrams;

22. Discuss the utility of chalkboard/blackboard, bulletin board and flanned board in teaching learning process;

23. Appreciate the utility of Models, Posters, Filmstrip, Projectors, Slide Projectors, Epidiascope, Overhead Projector and Microfiche;

24. Specify the significance of Field Trips and Excursions;

25. Specify the role of Exhibits in Education;

26. Dpecify the role of Museums in education;

27. Discuss the role of educational Radio and T.V. in education;

28. Identify the role of tape recorder and record player in education;

29. State the potential advantages of V.C.R.

30. Evaluate the advantages of video disc.

31. Discuss the role of language laboratory in teaching and learning process.

32. Explain the nature of communication.

33. Discuss the problems of communication.

34. State communication theories and models.

35. Describe communication and education.

36. Identify the selection of media for effective learning.

37. Discuss the role of educational objectives and media in planning and producing of instructional materials.

38. Explain the curriculum content and the relevant media for producing instructional materials.

39. Specify teaching strategies/models and media to be used in teaching.

40. Appreciate the role of media in effective teaching.

41. Discuss the production process of instructional materials.

42. Explain the organization and management process of educational media.

43. Differentiate the expensive and in-expensive materials.

44. Discuss the role of teacher in the proper using of the media.

45. Explain the problems and measures of procurement of materials.

46. Identify the sources of procurement of materials particularly at local, provincial, national, and international levels.

47. Evaluate the role of media resource centre.

48. Identify the important new innovations in educational technology.

49. Discuss the role of computer in education.

50. Explain the significance of satellite system in teaching-learning process.

51. Specify the role of teleconferences in education.

52. Evaluate the role of interactive video in education.

Unit No.1

THE NATURE OF EDUCATIONAL TECHNOLOGY

By

Dr. Muhammad Rashid
Liaquat Ali Goraha

1.1 INTRODUCTION

The word technology has been derived from the Greek words 'Techne' and 'logia'. The former means an art or craft and the latter means systematic study. Work 'technikes' refer to that which is skillfully and expertly produced. Technology is a man made device, a process or a logical technique designed to produce a reproducible effect.

Technological innovations have brought in machines and new techniques to modern societies. The introduction of new media has necessitated improvement in instructional methods for better cost-effectiveness value of educational programmes.

According to Unesco (1978, PP. 9-10), the concept of educational technology has passed through three stages of development. By 1967, it was referred to as audio-visual aids. Till 1975, it was known as methods, materials and techniques. By 1978, it was termed as systems analysis. Thus managers of educational technology moved from technicians to specialists and then to groups. At the first stage, the objectives were restricted to technical and practical skills, at the second stage, these were limited to optimisation of the teaching-learning process through media, and, at the third stage, to new attitudes and approaches.

The concept of educational technology varies from one group of people to the another. The National Council of Educational Technology of U.K. considers educational technology as "the development, application and evaluation of systems, techniques and aids to improve the process of human learning". Gagne (1968), p.7) views it as "a set of systematic techniques and practical knowledge for designing, testing and operating schools as educational systems".

Eraunt (1977, p.3) viewed educational technology as an instrument for preparation and use of educational materials, improvement of curricula, planning and organization of programmes and appropriate application of knowledge.

Hence, there is no agreement on any universally-agreed-upon definition of educational technology. According to Rowntree, (1988), educational technology is concerned with the design and evaluation of curricula and learning experiences, and with the problems of implementing and renovating them. Essentially, it is a rational, problem-solving approach to education, a way of thinking skeptically and systematically about the learning and teaching process.

However, in spite of the differences of opinion among various writers, a working definition of educational technology has been offered in order to highlight its historical perspective alongwith its scope.

1.2 OBJECTIVES

After studying the unit, it is hoped that the student will be able to:

1. explain the term educational technology.

2. discuss the nature of educational technology.

3. state the need of educational technology.

4. specify the scope of educational technology.

5. appreciate the changing concept of education.

1.3 CONCEPT AND SCOPE

The mechanisation of the teaching process has offered significant developments in the field of educational technology. Several teaching machines like Radio, T.V., Tape Recorder, Computer and Language Laboratories are in common use now-a-days. Even distance education has become possible due to these machines which are playing an important role in preservation, transmission and advancement of knowledge.

Following are the views of some eminent scholars about educational technology.

> "Educational technology is the application of scientific knowledge about learning and conditions of learning to improve the effectiveness and efficiency of teaching and training." **Sampath, K.et al (1981).**

> "Educational technology is the development, application and evaluation of systems, techniques, and aids to improve the process of human learning." **NCET (1969)**

> "Educational technology is an applied or technical study which aims at

maximizing educational effect by 'controlling' such relevant facts as educational purposes, educational content, teaching materials, educational methods, educational environment, conduct of students, behaviour of instructors and inter-relation between students and instructors"

Unwin, D and McAleese, R.(1978)

"Educational technology is the application of the scientific process of man's learning conditions." **Clarke, M.(1978)**

"Educational technology can be conceived as a science of techniques and methods by which educational goals can be realized."

Man, A.P & Brunstron C.P.(1982)

"Educational technology is concerned with the application of modern skills and techniques to the requirement of education and training. This includes the facilities of learning by manipulation of media and methods, and the control of environment in so far as this reflects on learning."

Wood, W.A. (1982)

An analysis of the above definitions makes it clear that educational technology is a very comprehensive field of education and includes learning, teaching, behavioural technology, audio-visual aids systems approach, instructional technology and programmed learning.

For further details, please read the below referred material.

Thomas, R.Murray, and Victor N. Kobayashi, ed. (1987)	Educational Technology: Its creation development and cross cultural transfer, Oxford, Pergman Press. PP.1-24	1-1

1.3.1 *Characteristics of Educational Technology*

a) It is based on scientific knowledge.

b) It is a continuous and dynamic process.

c) It makes use of psychology, science, technology, art, A.V. aids and machines.

d) It plays a vital role in making the teaching-learning process scientific, objective and interesting.

e) It has been helpful in the development and research of programmed learning, interaction analysis, A.V. aids and micro-

teaching.

f) It brings about an appreciable change in the behaviour of pupils and teachers.

g) It lays emphasis on the arrangement of evaluation-techniques and the measurement of the learning-teaching process.

h) It organizes learning situations to achieve objectives.

i) It encourages learning by controlling the environment.

j) It lays emphasis on the development of methods and techniques for effective learning.

Thus we see that educational technology is a new field of education connected with input, process and output.

1.3.2 *Scope of Educational Technology*

The scope of educational technology means to select the material to be used in this field and to determine its limits. Following are the limits of educational technology:-

1) Analysis of teaching-learning process: According to Wood (982), the area of operation of educational technology is (i) to analyse teaching-learning. In this process, all functional elements from the input stage to the output stage are analysed, (ii) possible activity of all these elements or components can be judged and (iii) to organize these elements in such a way as to get the best possible results.

2) Use in general administration, testing and instruction: Educational technology is frequently used in general administration, testing and instruction.

3) Proper use of machines and mass media: The field of educational technology covers machines and other mass media, projectors, tape-recorders, etc. It provides the base for utilization of all kinds of machines.

4) Determining educational goals or objectives: Educational goals or objectives can be determined and translated into behavioual terms. After these goals are determined, the educational and pupil demands can be justified.

5) Educational technology and teacher training: It plays a vital role in the training of teachers. It can be helpful in 'Construction of

Practice Teaching Models', micro teaching, simulation, systems approach, teacher behaviour, teaching behaviour and class-room interaction.

6) Selection, production and utilization of audio-visual aids: Educational technology contributes much in the selection, production and utilization of audio-visual aids. It can also be helpful in processing these aids.

7) Selection of strategies and tactics: Selection and development of strategies and tactics for teaching-learning can easily be done with the help of educational technology. It further helps in providing information about teaching models and various other techniques.

8) Useful in feedback: The main purpose of feedback is evaluation. The educational process cannot be successful till it is correctly evaluated. This evaluation is done against the background of teaching objectives. Feedback can help in judging the success of teaching and learning process and in reviewing the shortcomings. Educational technology helps in the selection and evaluation of feedback methods.

9) Utilization of systems approach: Educational technology is helpful in using the systems approach for evaluation of various sub-systems in the field of education. These sub-systems operate in or out of the class but within the school environment. Educational technology plays a significant role in determining the components of these sub-systems.

For further details, please read the below referred material.

Sharma, R.A. (1993)	Advanced Educational Technology, Meerut, Loyal Book Depot, PP.11-28.	1-2

1.4 THE NEED OF EDUCATIONAL TECHNOLOGY

An important aim of educational technology is to promote an educationally constructive interaction between the new facilities and other elements in educational theory and practice. Its present prominence stems largely from the emergence of new technical aids and of new knowledge about learning and the processes of communication, and it embraces not only the use of the new equipment and techniques but also their adoption and coordination to serve new

patterns and systems of learning. This involves a shift from a predominantly intuitive attitude to teaching and learning towards a more systematic and analytical approach. The practical consequences of this change in attitude include closer attention to the definition of objectives, selection and systematic use of the most appropriate and effective techniques and attention to the evaluation of results for the purpose of assessing or modifying the learning programme.

Finally, educational technology is something which may be perceived as developing within the education system and within industrial and vocational training. It may be commended or advocated, but it is not something prescribed from outside. However, it comprehends both technical aids and resource material.

In order to see the areas and development of the main concerns of educational technology, please read the following reference materials.

Fred Percival and Henry Ellington (1984)	A Handbook of Educational Technology London, Kogan Page PP.20-27	1-3

1.5 CHANGING CONCEPT OF EDUCATION

The term 'education' is very broad in its nature. Educationists do not depend upon one definition of education because its concept has been and is being changed with the passage of time.

If we compare the old life style to modern life, we see a vast difference. This difference can also be seen in the concept of education. For example, the computer is playing a very important role in our life. Now we travel by buses, cars, aeroplanes, railway, etc. Our demands have been increased. Our problems have increased as well. These problems are being solved by education. Thus the concept of education too has changed it has become industrial and vocational oriented.

Education has to be defined in terms of its intentions. It can also be defined in terms of results of the would - be educators. Education is a normative term and a degree word that implies that something of value is going on, and it is a word that we use without qualification of people who are in fact or less well educated.

Education is involved in a number of possible activities designed to contribute to the emergence of a worthwhile state of being, to a marked degree educated. The crucial question becomes, what is to count as being educated? Is it a matter of acquiring a style of dress, a code of manners, a set of beliefs or some combination of these? Is it to be identified with specialist expertise? Should we widen the concept to include distinction in any field of school endeavour? Do standardized tests of achievements accurately measure the level of education that individuals have attained?

To all these questions the answer is probably no, although some of these qualities may have some indirect relationship to being educated. Although other conceptions are certainly possible, a widespread view is that education is essentially a matter of breadth of understanding. It is a cognitive matter. But those who feel that schools are over - concerned with the intellect, or those who wish to stress the importance of emotional and aesthetic development, may feel worried. However, education is a normative term. There is no need for us to insist that all the various functions of schooling are part of education.

Changing concept of education can be seen from philosophies of education. A specific philosophy has its own concept of education. Much conflict results due to these philosophies.

Armstrong et al (1981, P.216) adds to the perennialist view as "on the search for and the dissemination of unchanging principles". Though they grant that changing times bring some surface level alterations in the problems people face, they feel that the real substance remains basically unchanged over generations. Moreover, truths have been revealed progressively, and views change as to the essence of reality. Knowledge is a tentative explanation that may fit present-day reality, cannot remain truth for ever.

Essentialism holds the view that essential things should be taught to all learners. These things may change from time to time. There is no emphasis on truths which are believed to be constant from generation to generation.

Reconstructionism aims at building a fresh society with heavy emphasis on economic abundance, human welfare and democratic decision-making. Goals of education are as such designed to achieve these. Focus of Gustentialism is one's individual existence, thus, this school of thought lays emphasis on constructing ones own meaning and purpose for existence. According to it, all

meaning is individual. Individual is responsible for everything that comes to him.

Every philosophy has its own implications for education. Different educationists define education in their own way. For example, existentialism lays heavy emphasism on individual choice, individual freedom, individual responsibility. So education should include sharpening the intellect alongwith attention to attitudes, feeling values and other subjective components.

To have a better comprehension please read the following referred material.

Webb R.B. and Sherman R.Robert (1989)	Schooling and Society: New York: Macmillam. PP. 18-27	1-4

1.6 ACTIVITIES

1) Prepare a chart of different definitions of educational technology with the help of referred materials and display it in the workshop for discussion.

2) Observe a lecture of your colleague and then suggest the ways how educational technology can improve his/her teaching.

3) Discuss the application of educational technology in schools with the headmaster of your school/education officer of your district. Prepare a report of this discussion.

4) Arrange a semi-seminar at your school and discuss the role of educational technical in planning classroom lessons.

5) Prepare a summary of this chapter, distribute it among your colleagues and then discuss.

6) Differentiate educational technology from A.V. aids while discussing it with your colleagues.

1.7 EXERCISE

Hopefully, you have read the unit, now please reply the following questions:

Q.No.1 Explain the concept and scope of educational technology with examples.

Q.No.2 Describe the need of educational technology in your life.

Q.No.3 Highlight the changing concept of education.

Q.No.4 Offer a working definition of educational technology, keeping in view the discussion given in the study guide.

Q.No.5 When was the term educational technology first used in the context of education and training? Discuss how and why it was used?

Q.No.6 Critically examine the historical perspective of educational technology?

Q.No.7 Educational technology can play a pivotal role in upgrading the level of education and training in Pakistan. How?

Q.No.8 Describe the steps of the development, creation and cross-cultural transfer of educational technology?

1.8 BIBLIOGRAPHY

1. Armstrong, D.G., Kenneth, T.H. & Tom, V.Savage, Education: An Introduction, New York, Macmillan Publishing Co., Inc.

2. Clarke, M (1982) Technology in education and educational technology, Prospects, 12,3

3. Eraut, M (1977) Inservice Education for Innovation, London, N.C.E.T.

4. Fred Percival & Henry Ellington (1984) Advanced Educational Technology, London, Kogan Page.

5. Gagne, R.M.(1968) 'Educational Technology as technique' Educational Technology, 6, November 15.

6. Man, A.P. and Brunstron, R. (1978) Aspects of Educational Technology, London, Pitman.

7. Rowntree, Derek (1988) Educational Technology in Curriculum Development, London, Paul Chapman Publishing Ltd.

8. Sampath, K.et al(1981) Introduction to Educational Technology, New Delhi, Sterling Publishers Pvt. Ltd.

9. Sharma, R.A.(1993) Advanced Educational Technology, Meerut, Loyal Book Depot.

10. Thomas, R. Murray & Victor, N. Kobauash, ed (1987) Educational Technology: Its Creation, Development and cross cultural Transfer. Oxford: Pergamon Press.

11. Unesco (1978) Final Report of the Seminar for the training of Experts in Educational Technology, Paris, Unesco.

12. Unwin, D. and McAleese, R. (1978) Encyclopedia of Educational Media, Communication and Technology, London, Macmillan.

13. Webb, R.B. & Sherman, R.r. (1989) Schooling and Society. New York: Macmillan.

14. Wood, W.A. (1982) Educational Technology towards a definition. Innovation, 33, 5-6, March.

Unit No.2

EDUCATIONAL TECHNOLOGY IN LEARNING

BY
Dr. Muhammad Rashid
Liaquat Ali Goraha

2.1 INTRODUCTION

The problem of learning is very important in psychology and education. Each individual is born with some native endowments which determine his responses. These native tendencies are not enough in the struggle for existence. Any organism at any stage of its evolution, is not only in an environment but is being reacted upon by that environment and reacting in turn to it. And all such action-reaction behaviour involves changes and modifications of the organism, as well as (in some cases) changes in the environment. That is why learning is called modification of behaviour through experience and training. It is, therefore, growth, a developmental process. What man learns actually is determined on the one hand by his constitution, and on the other by the demands which the environment makes upon him.

Learning is the key process in human behaviour. Parents and teachers are greatly interested in the child's learning. His instincts, attitudes, appreciations, skills and abilities are primarily the product of learning. It influences our language, our interests and even our goals. Child learns to sit, stand, walk or run, to talk. He learns to hold a pen and to write. He makes use of language to identify natural objects. He classifies objects such as grapes, bananas, mangoes, apples etc., he distinguishes between a crow and a monkey. A few days back he preferred to play alone, but now he enjoys the company of his classmates. He used to have temper tantrums if his friend took his bat and ball, but now he shows restraint. All these points emphasize that change is taking place in child's behaviour, or we may say that learning has taken place. Whenever there is a complexity in life, learning tries to solve it. and, it is in this light that learning is also known as a process of problem-solving.

Briefly speaking, learning is a change in behaviour-organization. It is the organism as a whole that learns. Psychologists remark, "Learning as reconstruction, combines thinking, skill information and appreciation in a single unitary process, and it is characterized by flexibility, since it must constantly adapt itself to the circumstances of the situation and the environment." Thus, the child in the school learns many subjects and gradually finds himself a totally changed man. He learns a sense of personal worth and his whole self is changed. Therefore, teachers should remember that they are dealing with pupils as persons and they should be very careful in doing so

Moreover, in its biological nature, it is the capacity to be found in plasticity of the nervous system which is due to the changes occurring in the formation of bonds and connections. Learning is the super-structure of our personality and character built upon the foundation of natural inherited organism

by coming into contact with the world. Thus learning is life and life is learning. Every experience is learning. Psychologists say that the process of learning is the vehicle by which the individual changes from a bundle of potentiality to an active organism with ideas, habits, skills and other personality characteristics.

In the process of learning, needs arise, goals are set up, adjustments begin, changes in behaviour take place to stabilize the personality. Further, learning involves problem-solving i.e. understanding and discovering relations between different contents in a situation. Here one may argue that why should one learn? The answer is that learning is an activity aroused by personal and social demands. Hence it is the demand of the individual himself; it is the demand of the society who makes him feel to learn. But, the individual may learn things both desirable and undesirable. The task of education should be to enable the individual to learn the desirable and eliminate the undesirable. So it can be said that learning is a process of improvement.

Learning at all stages is a continuous process involving progressive organization of human behaviour, to meet new developments in the environment. A few defining characteristics of learning may be mentioned as under:

Firstly, all living is learning i.e. the individual is in active relation with his environment.

Secondly, it results in a change in behaviour. We can note a change in the student's response to the teacher questions after lecture. It is a change of behaviour influenced by previous behavior. It is an activity that leaves a more or less permanent effect on later activity.

Thirdly, learning in an adjustment. Most learning in children consists in modifying, adapting and developing their original nature. In later life individuals acquire new forms of behaviour.

Fourthly, It comes about as a result of practice. This characteristic eliminates such phases of change as illness and maturation. Potent effects of motivation on behaviour are worth consideration here.

Fifthly, learning is universal. Every creature that lives learns. Man learns most. Human children have the longest period of immaturity and helplessness, and hence the longer period for opportunity for learning. The human nervous system is very complex, so are human reactions and human acquisitions.

Sixthly, learning is a relatively permanent change. After a rat wakes up from his nap he still remembers the path to the food. Even if you have not been on a bicycle for years, in just a few minutes' job practice you can be quite proficient again.

Seventhly, learning is growth. It is never-ending growth. At each stage the learner acquires new visions of his future growth and new ideals of achievement in the direction of his effort. Each achievement forms the basis of a fresh endeavour, and thus the constant urge of his soul to newer and higher ideals of work and achievement is progressively fulfilled.

Lastly, learning is not directly observable. The only way to study learning is through some observable behaviour. Actually, we cannot observe learning, we see only what precedes performance, the performance itself, and the consequences of performance.

Learning is not confined to human beings only. Animals also learn in a similar fashion. The juggler makes the monkey to learn so many tricks. Dogs are trained to catch thieves, elephants are taught to perform circus tricks, pigeons learn to play pingpong. Dolphin fish are noted for playing net-ball or passing through a ring. The only difference in animal learning and human learning is in the extent of learning because learning depends upon their mental structure.

What role can educational technology play to make the learning process more effective and efficient? Effort has been made in this unit to highlight the process of learning and particularly the role of teacher and technology in learning.

2.2 OBJECTIVES

After studying the material, it is hoped that the student will be able to:

1) define the term learning;

2) discuss various theories of learning;

3) evaluate educational implications of theories of learning;

4) explain the process of learning; and

5) specify the role of teacher in learning.

2.3 THEORIES OF LEARNING

Various theories of learning have been put forward to explain the nature of the learning process. All these can be broadly classified into two categories:

1) Connectionist or Behaviourist or Mechanicalistic or Associative or S-R-theories.
2) Cognitive or Gestalt or purpose or Organismic or Field or S-O-R theories.

2.3.1 *S-R Theories*

Generally a student of psychology understands the paradigm S-R, which means that stimulus is connected with and leads to response. Stimulus is any change in external energy, which excites the nervous system and brings about a response. Thus, response is the end product of the S-R chain. Complex responses form behaviour. Certain responses follow certain stimuli. Learning is a matter of connection between S and R. What we learn are habits and tendencies. The theory explains that the learner solves his problems by assembling his past experiences and responds to the new problem either according to elements common to the old and new situations, or according to some aspects of the new situation which are similar to the old situation. If there is no similarity we indulge in trial and error behaviour. When these circumstances are studied and put together in some logical form, we have a theory. Within this broad category, the following three theories will be discussed in detail:

(a) Pavlov's Classical Conditioning Theory.
(b) Thorndike's Trial and Error Theory.
(c) Skinner's Operant Conditioning Theory.

2.3.2 *S-O-R Theory*

S-O-R theory points out that even with appropriate past experience, the organism may not solve the problem if it is presented one way, and will solve it if it is presented in another way, because there is a spontaneous reaction to the contemporary structuring of the field which is not necessarily dependent upon the previous experiences. The supporters of this theory believe in an intervening process or intervening variable, as there is no such variable present in S_R theory, according to the connectionist viewpoint.

As regards the nature of this intervening variable, the human being is believed to have a mind that controls behaviour to some extent. So we think, we know, we are conscious, we have purpose, we imagine, we believe, we will. Whereas according to the connectionists, the human organism works only on S-R pattern like a highly complex machine and the will, the purpose, the intention, have no place here. Field theorists take these processes into consideration and make 'cognition' a significant aspect of their theory. They look upon the learner as a dynamic energy systems set into an environment, that is in turn a complex of other energy systems. Both the learner and the environment are dynamic and not passive. They both act and react in a field. Within this broad category the following two theories will be discussed in detail:

(a) Gestalt or Insight Learning Theory.
(b) Kurt-Lewin's Field Theory.

For a thorough understanding, the following diagram will suffice the purpose.

THEORIES OF LEARNING

Connection Ist Theories (S- R)	Cognitive Theories (S.O.R)
- Pavlov's Classical Conditioning	- Gestalt or Insight Theory.
- Thorndike's Trial and Error or Operant Conditioning Theory.	- Kurt - Lewin's Field Theory.
- Skinner's Operant conditioning Theory.	
- Miller's Theory.	
- Hulli's theory.	
- Watson's Theory.	
- Guthrie's Sign Learning Theory.	

2.3.3 *Associate Learning Theory (Behaviouristic View)*

This is learning from the behaviouristic viewpoint. According to this viewpoint learning is "formation of conditioned reflex" or "acquisition of involuntary anticipatory adjustment" or "a habit formation" so that behaviour may become automatic. By "anticipatory adjustment" Pavlov meant "organic behaviour" which is "not complete" but "with a gap in the whole equilibrium pattern". For example, hunger in which saliva gastric juice, function of the stomach, etc, are the organic behaviour with a gap, and so incomplete. It becomes complete when the object of hunger is obtained. Importance of anticipatory adjustment is very great because, firstly, it is the foundation of all voluntary behaviour. Secondly, it is the active desire that sets the goal and makes the organism strive. Thirdly, it determines "the mind-set" or "organic pattern of readiness." Unless this organic pattern takes place within, no real learning can appear. If one can control this anticipatory adjustment one can also control learning. This controlled learning is conditioned learning. Here the thing to be learnt is termed as cue stimulus, and this is then followed by a satisfying stimulus. This combination is repeated again and again and ultimately the learning of the cue-stimulus is established. This is conditioned learning.

Conditioned learning is also accompanied by a generalization of the experience. For example, a child whose fear is conditioned to a white rat also begins to fear a rabbit, cotton wool, a white fur coat and other similar objects. When the same process is repeated again and again for a long time after the conditioning has taken place, it produces adverse effects. The conditioned S-R becomes extinguished. For example, repeated exposure of the rat may gradually reduce the fear after it has been conditioned.

Conditioned learning actually means responding normally by a natural response to an unnatural situation or stimulus, when in fact, the response is to be in the presence of the natural stimulus. A child feels watering of the mouth when he see or smells food and not by simply hearing the dinner bell. But it is also a common experience that the ringing of recess bell in school leads to watering of the mouth. This learning, or watering of the mouth on hearing the bell, is conditioned learning. It is established when repeatedly the recess, bell is followed by some refreshments, meals or lunch during recess, then bell and food are associated in quick succession. Much of the learning is by conditioning. Fear, anger and many such reactions are aroused by unnatural, irrelevant or unusual stimuli. The approaching peon of the boss, for example,

aroused nervousness and fear, though the peon himself is harmless and innocent. But that peon always brought some unpleasant message, letters or news from the boss's office and so the person is conditioned to the approach of this peon which leads to arousing of fear and nervousness. Similarly, if two friends have been seen together a number of times, seeing one makes one to think of the other. These are all illustrations of associative connections. This idea of association has been the basis of the conditioned response theory, according to which learning consists in building up of new associative bonds between a stimulus and a response.

2.3.4 *Educational Implications*

Many items of school subjects are learnt more adequately through this process. Reading, writing and spelling are learnt more effectively through the process of conditioning. Direct method of teaching English is just a process of conditioning. We learn many things in a better way through this process and that is perhaps the reason why language is more efficiently learnt by living in the society in which it is spoken. Teaching through visual aids also implies the same principle.

Discipline may also be caused through conditioning. Good sentiments, good habits, virtues and ideals etc., which are the components of discipline, are effectively learnt through the process of conditioning, and they are learnt more surely, in a society in which they are actually lived and acted upon.

Classroom procedures are often far removed from the natural procedures required for the process of conditioning. Languages are not taught as they ought to be in connection with many vivid and widely different experiences. If regulations, commands and virtues are followed by friendly behaviour, and the most sympathetic attitude of the teacher he can bring about a compliant emotional tone in the class that no amount of punishment can accomplish. But uniformity of procedure is essential. Voluntary action may be controlled through reasoning, punishment and reward, but if its involuntary basis is neglected, it will not endure. In conditioning, involuntary responses are controlled through the cue stimuli.

Many of our fears and phobias may be traced back to some kind of conditioning. When things and objects associate with an unpleasant experience a sort of generalization is made, phobias appear. Such fears and phobias can be removed by de- conditioning. Dislike for a teacher or

certain school subjects can also be overcome through reconditioning by associating pleasant stimuli with them.

The conditioned response theory may also help in explaining many of our repugnances and unexplained reactions to people, places and things. Such conditioning often takes place in childhood, and though the real causes are not known the effects remain. In this way, many of our reactions are not natural but simply caused of conditioning.

In experimental psychology, the theory of conditioned reflex occupies an important place and has revolutionised child learning. Before the advent of this theory, the knowledge of the process of learning was vague. It is now a psychological truism that the child's learning consists in the establishment of conditioned reflexes through the formation of permanent habits. The intelligent learner can establish conditioned reflexes with facility, while the idiot cannot. Lastly, this theory brings learning under the teacher's control, making desired learning conditioned by situations created or regulated by the experimenter himself.

> "Different kinds of habits based on training, education and discipline of any sort are nothing but a long chain of conditioned reflexes." **Pavlov.**

2.3.5 *Some Objections*

In spite of the above merits, the conditioned reflex theory of learning is open to serious defects. It is a mechanical theory overlooking the learner's attention and other higher mental processes and in default of these conditions, this theory does not work. Learning depends largely upon the learner's will, interest and attention. Further, not all stimuli can be conditioned by unconditioned ones. For example, the child's natural love for the mother cannot, normally, be conditioned by the unconditioned stimulus of seeing some body else, whom he naturally hates, associated with the mother. Secondly, the theory of conditioning lays emphasis on repetition of stimulus and response to strengthen the connection between them. Thirdly, the theory is not put forward as an explanation of learning. It merely states the conditions of learning. The condition that must be present, if learning is to occur, are but two unconditioned or well established conditioned responses and time. A certain amount of frequency or duration of time, is required to permit effective factors to operate. The space of time separating the two stimuli or responses to be connected must be too great for the backward or forward spread of association. Finally, the theory has been considerably elaborated into ascending order of

conditioning, to explain the higher thought and reasoning processes and even voluntary activity. At this point most psychologists demur. While conditioning gives a plausible account of the conditions of specific learning, particularly those involving emotional reactions, its adequacy in the case of complex thought processes is widely questioned. To the educator, in particular, it is of no apparent value in describing the higher stages of learning.

2.3.6 *S-R Bond Theory or Thorndike's Trial and Error Theory*

Edward Lee Thorndike (1874-1949) is generally considered to have been the foremost educational psychologist, not only of the United States but of the world. He contributed to research and theory in the field of learning and genetic psychology, testing and social psychology. Thorndike first stated the elements of his theory of learning in 1913, that connections are formed in the nervous system between stimuli and response. This formation of connections is illustrated by the symbols S-R. Another word used to describe these connections is the word 'bond' and hence, this theory is sometimes called the 'Bond Theory of Learning'. Thorndike says "Learning is connecting. The mind is man's connection system".

According to Thorndike, learning takes place by trial and error. Some people call it "learning by selection of successful variant". Accordingly when no ready-made solution of a problem is available to the learner, he adopts the method of Trial and Error. He first tries one solution. If it does not help him, he rejects it. Then, he tries another and so on. In this way, he eliminates errors or irrelevant responses which do not serve his purpose and finally discovers the correct solution. Thus, in Trial and Error method, the learner makes random activities and finally reaches the goal accidently. Here, one thing should be remembered that in Trial and Error, there are often systematic and relevant responses. Activities are not wholly random. All these activities, though apparently random, are suggested to him by the situation and the learner proceeds on accordingly. The stages through which the learner has to pass are Goal, Block (hindrances), Random Movements or multiple response, chance-success, selection and fixation.

When and how the connection is accomplished was stated by Thorndike in the following three laws:-

1) *Law of Readiness*

The first primary law of learning, according to Thorndike, is the 'Law of Readiness' or the 'Law of Action Tendency', which means that learning takes place when an action tendency is aroused

through preparatory adjustment, set or attitude. Readiness means preparation for action. If a subject is not prepared to learn, a thing cannot be automatically in-stilled in him. For example, unless the typist in order to learn typing, prepares himself to start, he would not make much progress in a lethargic and unprepared manner.

2) *Law of Exercise*

The second law of learning is the 'Law of Exercise' which means that drill or practice helps in increasing efficiency and durability of learning, and, according to Thorndike's S-R Bond Theory, the connections are strengthened with trial or practice and the connections are weakened when trial or practice is discontinued. The law of exercise, therefore, is also understood as the 'law of use and disuse' in which case connections or bonds made in the brain cortex are weakened or loosened. Many examples of this are found in case of human learning. Learning to drive a motor-car, typewriting, singing or memorizing a poem or music etc, need exercise and repetition of various movements and actions many times.

3) *Law of Effect*

The third law is the 'Law of Effect', according to which the trial or steps leading to satisfaction stamp on the bond or connection satisfying states which lead to consolidation and strengthening of the connection, whereas dissatisfaction, annoyance or pain lead to the weakening or stamping out of the connections. In fact, the law of effect signifies that if the responses satisfy the subject, they are learnt and selected, while those which are not satisfying are eliminated. Teaching, therefore, must be pleasing. The educator must obey the tastes and interests of his pupils. In other words greater the satisfaction stronger will be the motive to learn. Thus intensity is an important condition of the law of effect.

These are three basic laws. Thorndike also refers to five subordinate laws which further help to explain the learning process. These are:-

a) *Law of Multiple Responses*

According to it the organism varies or changes its responses till an appropriate behaviour is hit upon. Without varying the responses, the correct response for the solution might never be drawn up. If

the individual wants to solve a puzzle, he is to try in different ways rather than mechanically persisting in the same way. Thorndike's cat in the puzzle box moved about and tried many ways to come out, till finally she hit the latch with her paw which opened the door and she jumped out.

b) *The Law of Set or Attitude*

Learning is guided by a total set or attitude of the organism, which determines not only what the person will do but what will satisfy or annoy him. For instance, unless the cricketer sets himself to make a century, he will not be able to score more runs. Similarly, a student, unless he sets to get first position and has the attitude of being at the top, he would waste his time and would not learn much. Hence, learning is affected more in the individual if he is set to learn more or to excel.

c) *Pre-Potency of Elements*

According to this law, the learner reacts selectively to the important or essential elements is a situation and neglects the other features or elements which may be irrelevant or non-essential. The ability to deal with the essential or the relevant part of the situation, makes analytical and insightful learning possible. In this law of pre-potency of elements, Thorndike is really anticipating insight in learning which was more emphasized by the Gestaltians.

d) *Law of Response by Analogy*

In this law, the individual makes use of old experiences or acquisitions while learning a new situation. There is a tendency to utilize common elements in the new situation as they existed in a similar past situation. Learning to drive a car, for instance, is facilitated by the earlier acquired skill of driving a motor cycle or even riding a bicycle because the perspective or maintaining a balance and controlling the handle, helps in steering the car.

For further comprehension please read the following material.

Bhatia and Bhatia (1996)	A Textbook of Educational Psychology, New Delhi, Doaba House Publishers, PP. 220-224.	2.1

2.4 THE PROCESS OF LEARNING

Learning is not one process. It is not an activity or set of steps which are engaged in any situation which result in learning of a specific matter. But there may be general elements common to all aspects of learning.

2.4.1 *Acquisition.*

Acquisition is a change in performance due to experience. Learning can be inferred from experiences. Now learning can be positive or negative in relation to the desirable performance. Learning occurs in two stages. The first stage is known as early learning. It is slow and involves the acquisition of basic discrimination. Second stage is known as later learning. It builds upon the foundation of early learning and involves the acquisition of generalizations.

2.4.2 *Retention*

Retention is a permanent change in performance due to practice. Meaningful content is more easily learned than mere content. Learning with understanding depends very much upon readiness for the task, practice in variety of contexts and conditions of practice.

2.4.3 *Transfer*

Transfer is the effect of previous learning on performance in a new situation. It may be positive, negative, or zero. Positive occurs when previous learning situations facilitate subsequent performance. Negative transfer occurs when previous learning situations interfere in performance. Zero transfer occurs when previous learning situations do not affect subsequent performance.

For further detail, please read the below referred material.

Aggarwal, J.C (1995)	Essentials of Education Technology: Teaching learning PP. 60-66	2.2

2.5 ROLE OF TEACHER IN LEARNING

During the teaching-learning process, the teacher has to play multiple roles in the classroom. Swarup, S and Oberoi (1994, P.277) have summarized the teacher's role in the light of research.

1. Effective teachers provide an overview of what is to be learned.

2. Readiness activities emphasize the linking of new information to prior

knowledge and the pre-teaching of difficult vocabulary.

3. Emphasis is placed on examples and application of concepts, principles, and vocabulary terms.

4. Explanations are provided or examples utilized in instruction.

5. Teachers monitor students' comprehension.

6. Learning cues, including cautions concerning probable error, are provided.

7. Strategies for vocabulary learning and/or metacognitive learning are taught.

8. Students engage first in guided practice and then in independent practice to correct learning errors and provide positive reinforcement.

The teacher plays a very important role in learning. In this section, we are going to consider some of the research findings and examine their implications. Our goal is to understand what makes a teacher more efficient. What should be the qualities in the teacher to play a very important role in learning.

Before teaching the learners, the teacher must first understand the learners' previous knowledge and experience. Then he should teach the learners according to their potential. He should pay full attention on the slow learners as well as the gifted ones. He should not punish them but should encourage them. This is necessary for affective growth. Thus the ability to understand others is the first level of teaching development. A good teacher may possess the following qualities:

2.5.1 *Open-mindness*

The teacher should be open-minded. This quality of open-mindness also implies the ability to listen, to respond, and to interact with the students, free from the constraint of imposing value criteria. The open-minded teacher is functionally non-judgmental. This does not mean that the teacher holds no judgements or communicates no values to the students. No, the teacher accepts the students' values while encouraging them to question these values when he feels they are in need of clarification.

2.5.2 *Sensitivity*

This is a prime factor which contributes towards effectiveness. While open-mindness makes possible a comprehensive and accurate view of the student, sensitivity is a cognitive as well as emotional response to the student as a whole person. This makes possible to have a deeper and more spontaneous response to the student's needs, feelings, conflicts, doubts and so on.

2.5.3 *Empathy*

This comes in when the teacher is dealing with the student as a whole person. If he is empathetic, his understanding allows him to experience fully the feelings and perceptions of the student. The teacher must be able to experience the student's feeling as the student is experiencing them. He must put himself emotionally and intellectually in the student's position. Thus if the student is experiencing boredom during a classroom lesson, the empathetic teacher will understand the sources of the boredom, its qualities as the students experiences them and its ramifications. Secondly, the teacher must maintain his own identity and remain sensitively aware of the difference between himself and the student.

2.5.4 *Objectivity*

To remain objective in the teaching profession means to be able to stand back and observe what is happening from a neutral, or non-imposing, frame of reference. When one is objective, one is not involved to an extraodinary degree with another. In terms of our discussion of empathy, we can see objectivity as the extension of the "as if" quality of the intellectual realm of experience.

In terms of practical classroom application, objectivity is especially important in communicating the subject matter, in answering students' questions, in establishing a contingency system, and in evaluation. If the teacher is performing to the appropriate level, he is objective in his perspective.

One aspect of objectivity is cognitive flexibility. This term refers to "an ability to think and act simultaneously and appropriately in a given situation and to dimensions of open-mindedness, adaptability and a resistance to premature closure".

Finally, I would say that the teacher neither knows exactly with what hereditary seeds an individual has been born nor can he afford to ignore the

environment. What he can do is only to provide the learning child with the best opportunities, and a right kind of environment in which the child can fully realise his potentialities. The wisdom of the teacher lies in his belief that, though, every human being is born with different capacities, yet, great or small, these potentialities require an order to be actualized through constant exercise and certain environmental conditions. Intellectual powers are augmented by the habit of precise reasoning, the study of logic, the use of mathematics, mental discipline and observation of things. On the other hand, education will be baseless if the teacher assumes beforehand that, whatever the training, the child's growth cannot surpass his hereditary powers. In order to reach its highest development, whatever be the gifted traits of an individual, the mind demands an ensemble of conditions which only the ideal environment can provide.

For further comprehension please read Armstrong, D.G. et al and Sharma R.A. who give good ideas about the role of the teacher for effective teaching. Their ideas are given in the below referred material.

Armstrong, D.G. etal (1981)	Education: An Introduction. New York: Macmillan Publishing Co, Inc. PP. 232-244	2-3
Sharma, R.A. (1993)	Advanced Educational Technology. Meerut, Loyal Book Depot.	2-4

2.6 ACTIVITIES

1. Arrange a semi-seminar of your colleagues. Discuss their concept of learning and then record it for workshop.

2. Develop objective of a lesson according to behavioural theory and discuss these in a tutorial meeting.

3. Make two small groups (each of three colleagues), one to represent cognitivism and the other traditionalism. Critically analyse the position of each group through discussion.

4. Observe a class of your school. List the characteristics which fall into traditionalism.

5. Keeping in view your situation, have a meeting with your M.Ed. colleagues and make the list of roles that our teacher should play in schools.

2.7 EXERCISE

Q.No.1 Discuss the nature of learning.

Q.No.2 Explain the characteristics of learning.

Q.No.3 The only difference in animal learning and human learning is in the extent of learning, because all learning depends upon the structure. Discuss.

Q.No.4 Educational technology facilitates learning. How?

Q.No.5 Critically examine the behavouristic learning theories.

Q.No.6 Distinguish between salient features of cogniticism and behaviourism.

Q.No.7 Discuss Maslow's hierarchy of needs.

Q.No.8 Conceptual framework of learning theory guides the learning process. How?

Q.No.9 There are some common as well as contrasting factors in behaviourism and non-behaviourism. Discuss.

Q.No.10 In many cases, our educational institutions practice traditionalism. Suggest ways to improve the situation.

Q.No.11 How can learning theories play an important role in learning?

Q.No.12 Critically examine the role of the teacher in learning.

Q.No.13 How can a teacher make his teaching more effective?.

Q.No.14 Write short notes on the following.

1) S-R Theories.
2) Pavlov's Classical Conditioning.
3) Educational implications of Associative Learning Theory.
4) S-R Bond Theory.

2.9 BIBLIOGRAPHY

1. Aggarwal, J.C. (1995) Essentials of Educational Technology: Teaching Learning Innovations in Education, New Delhi, Jangpura.

2. Armstrong, D.G. etal (1981) Education: An Introduction: New York: Macmillan Publishing Company, Inc.

3. Bhatia and Bhatia (1996) A Textbook of Educational Psychology, Delhi, Doaba House Publishers.

4. Sharma, R.A.(1993) Advanced Educational Technology, Meerut, Loyal Book Depot.

5. Swarup N.R. Saxena and Oberoi S.C. (1974) Technology of Teaching, Meerut, R. Lall Book Depot.

Unit No.3

DEVELOPING EDUCATIONAL OBJECTIVES

By
Dr. Muhammad Rashid

3.1 INTRODUCTION

The aim of education is the development of a person as a whole. For the realisation of this aim various activities have to be organised in and out of school. Aims are very wide and comprehensive. Home, school and society all contribute towards their realisation. Objectives are part of these broader aims. Schools can help in achievement of objectives of instruction. The teachers should be clear in their minds about the objectives of teaching the subject. Or a lesson must be cleared about the instructional objectives to be delivered, learning experiences to be organised and the evaluation procedure to be adopted to know whether the instructional objectives have been achieved or not. The instructional objectives need to be expressed in behavioral terms to make their achievement and evaluation tangible. The behavioural changes to be brought about in the students should be observable.

According to Houston
"An instructional objective is an ability or skill expressed in behavioural terms which the pupil acquires when the teaching has been successful in doing what it set out to do".

According to E.J. Frust,
"Instructional objectives are desired changes in behaviour in a person, that we try to bring about through education."

The needs and capacities of the child, needs of the society and nature of the subject are kept in mind while framing instructional objectives, which need to be specified in observable behavioural terms. Instructional objectives have been divided into three domains:

1. Cognitive Domain - It relates to changes in mental abilities and capacities.
2. Affective Domain - It relates to change in feelings and attitudes.
3. Psycho motor Domain. - It relates to changes in doing aspect and skills.

Effort has been made in this unit to highlight all the steps which are required to be kept in mind while writing educational objectives.

3.2 OBJECTIVES

After reading the unit, it is hoped that the student will be able to:

1. distinguish between aims, goals and objectives;

2. explain the characteristics of objectives;

3. recognize and discriminate between Cognitive, Affective and Psychomotor objectives;

4. state what words should be used and what words should be avoided while writing the objectives; and

5. discuss how to write objectives in behavioural terms.

3.3 AIMS, GOALS AND OBJECTIVES

All educational programmes are based on aims, goals, and objectives, and then listing the topics, stating the general purposes of teaching each topic. Romiszowski (1981) refers to aims, goals and purposes as a general statement of intent, stated in in-put terms. For example, to teach history, to spread the gospel or in process terms. For example, to solve mathematical problems. The statements are not stated in a systematic way.

However, Davies (1976) makes a distinction between aims and goals. He states that aims "Carry a greater probability that they will not be achieved, and there is almost an implicit feeling about them that they will somehow be very difficult to implement". Likewise, the term "aims" is used to signify a statement providing direction to the educational enterprise at a level of specificity and detail which is intermediate between the limits indicated by the forthcoming term goals.

From the above, it is clear that "aim" is a statement of intent and is the first step in planning a programme. It is a non-specific guide-line and relates to overall policy of strategy rather than to detailed specifications.

"Goals" are general objectives which express an observable strategy, that "represent an attempt to operationalise the thinking represented by aim, to make it more practical and specific" (Davies, 1976); that is "goals" are inferred descriptions or hypotheses. However, in clear terms, the "goal" signifies overall general "goals" that are designed to provide a global direction to educational enterprise as a whole. "Goals" are usually stated in broad comprehensive terms.

An objective is more specific and describes definite activities. It provides both the teacher and the student with a great deal of concrete help and direction. According to Bloom (1956), "objectives are not only the goals towards which the curriculum is shaped and towards which instruction is guided, but they also provide the detailed specification for the construction and use of valuative techniques". You will read in detail about the specificacity, measurability and unambiguousness of objectives in the following section of this unit.

As far as the difference between aims and instructional objectives is concerned, it is discussed as under:

(1) Aims are long term and comprehensive while objectives are short term and of a limited nature.

(2) There may be many objectives for the realisation of an aim.

(3) Objectives help in achieving the aims.

(4) Objectives can be achieved through school programme.

(5) Aims belong to education as a whole, while objectives are subjectwise - these may be different from subject to subject e.g. the objectives of teaching a language will be different from the objectives of teaching science.

(6) Objectives provide learning experiences while aims indicate ultimate achievements.

For further details, please read the below referred material.

Rowntree, Derek (1974)	Educational Technology in Curriculum Development, 2nd ed. London, Harper & Row Publishers. PP.19-33	3-1

3.4 CHARACTERISTICS OF OBJECTIVES

Determination of objectives is important in education because they provide us the direction in which we have to proceed. They provide the basis for the organisation of learning experiences and deciding about the tools and evaluation techniques to be used. Objectives further provide a clear picture about the nature and extent of behavioural changes that a teacher seeks in students. They are

useful both for teachers and students. They follow the objective-based approach in the teaching learning process which helps in analysing, preparing and presenting the content material according to the dimensions of objectives. The teacher organises the content material and learning experiences for the realisation of educational objectives. These also help in selecting the most appropriate method of teaching. The teacher makes use of various tools and techniques of evaluation to know the nature and extent of behavioural changes. These tools and techniques of evaluation are also based upon educational objectives. In the absence of these objectives, evaluation, progress and change cannot be measured properly. Therefore, we see that there is an intimate relationship between educational objectives, learning experiences and evaluation, which can be figuratively depicted as below:

Educational Objectives	Learning Experience	Evaluation

Bloom (1956) has defined educational objectives as "These are not only the goals towards which curriculum is shaped and towards which instruction is guided, but they are also the goals that provide detailed specifications for the construction and use of evaluation techniques."

In short it can be said that educational objectives help us in deciding the curriculum and learning experiences, methods of teaching, teaching-learning activities, the main teaching points, selection and construction of proper evaluation tools and techniques and apply them to know the nature and extent of the changes brought about among children.

However, education is a social process to bring about desirable changes in the individual according to the needs and philosophy of the society. There are three main sources of objectives:

a) Individual: The individual is the focus of attention in education. Changes in the thinking, feeling and doing aspects of his behavior are to be pointed out in order to help in the total and comprehensive development of his personality in accordance with his needs as well as the needs of the society. He needs not only knowledge but also needs to develop his abilities, capacities and skills, interests and attitudes and other personality traits to adjust himself adequately to his physical and social environment. As there are definite stages of psycho-physical development and acquisition of knowledge, there are various objectives according to these changes. Thus individual needs provide us the basis of educational objectives.

b) Content of subject matter: For the whole development of personality various curricular and co-curricular activities are organised by the school. All the subjects and activities of the curriculum have different objectives, though these may be some overlapping among them. These provide us the direction and basis for formulating educational objectives.

c) Philosophical and social environment: The philosophy of life of a society helps us in deciding educational objectives. Every society has certain norms and values which are reflected in its day-to-day life. Educational objectives cannot be against the prevailing social, cultural and philosophical environment of a society and have to be in accordance with these. Every society expects its members to acquire knowledge, skills, attitudes and interests not only to preserve itself, but also to progress. In this way, the philosophy of a society and its social and cultural needs provide us the basis for deciding educational objectives.

As far as the difference between educational objectives and teaching objectives is concerned, educational objectives are wider than teaching objectives. Teaching objectives are limited in scope. Educational objectives are general in nature while teaching objectives are specific to every subject and every topic. Educational objectives are long-term while teaching objectives are limited to a certain period of time. Teaching objectives are practical while educational objectives are theoretical. All the subjects may have the same educational objectives but their teaching objectives will be different.

Rowntree, Derek (1988)	Educational Technology in Curriculum Development Paul Chapman Publishing Ltd, PP.34-41	3-2

3.5 DOMAINS AND LEVELS OF INSTRUCTIONAL OBJECTIVES

The sources of educational objectives provide us an indication of the kind of development and change occurring in learners. Some of these are universal and general in nature while others are limited in scope. The universal and general objectives are applicable everywhere, and provide a basis for designing an education system and learning experiences. They also help us in designing the curriculum. The overall curriculum needs to be further broken up into smaller units in respect of time, resources and practicability for the achievement of various specific objectives. These specific objectives should be attainable from the learner's point of view, practicable in the light of valuable resources and worthwhile and useful from the social point of view. Various learning experiences are provided for the realisation of these short-term specific objectives. The selection and level of learning experiences depends upon the maturity level of the

learner and the content material.

First of all the general and over-all objectives of education are decided. After that the levels of educational objectives are determined according to the stages of education. For example, the educational objectives will be different for primary stage, middle stage, high school stage, higher secondary stage and college stage. Then the levels of educational objectives for each subject or activity at each stage are decided. Therefore, many considerations like stage of development of the learner, class, subject and desired changes have to be kept in mind while determining the educational objectives. The various levels can be stated as below:

a) Overall objectives;
b) Stagewise objectives;
c) Class or gradewise objectives;
d) Subjectwise objectives;
e) Unitwise objectives; and
f) Lessonwise objectives of education.

There are numerous educational objectives. These may belong to the mental, social, moral, emotional or physical aspect of learner. These are stated in behavioural terms. Some belong to one category, and some to another. Therefore, efforts were made to categorise them. B.S. Bloom and his associates (1956) evolved, a category system which is popularly known as **"Taxonomy of Educational Objectives"**. This category system helps us in evaluating the nature and extent of behaviour changes brought about among learners. It is used in almost all systems of education all over the world. Bloom translated these objectives into behavioural terms to make them observable, and measurable. The characteristics of this taxonomy are given below:

i) Educational objectives and behavioural changes can be described in an hierarchy from simple to complex.

ii) Categorization helps in selecting and organising appropriate learning experiences, methods and aids to be used, and adopting of proper evaluation techniques.

iii) It makes the whole teaching-learning process definite, specific and goal-directed.

iv) Educational institution authorities can evaluate the effectiveness of their curricular and co-curricular programmes in terms of desired predetermined

objectives.

The instructional objectives for learning can be classified into three main categories or domains.

3.5.1 *Cognitive domain*

Bloom has divided the cognitive domains into six categories on the basis of complexity and hierarchy of mental functions. This categorization proceeds from simple to complex acts, i.e. knowledge, comprehension, application, analysis, synthesis and evaluation. He further divided these into sub-categories. Knowledge comes at the lowest level of objectives. In connection with the cognitive domain, Bloom says "it includes those objectives which deal with recall and recognition of knowledge and development of intellectual abilities and skills".

- At lower level: It includes knowledge of facts, specifics, principles, terms, trends, classes and classification, criteria and methodology, knowledge of universals and abstracts of theories and structures. Comprehension includes understanding, translating and interpreting.
- At medium level: There is application of knowledge in different situations, and analysis of elements, relationships and principles.
- At high level: There is synthesis which means production of something unique, or production of a plan, and evaluation which means judging in terms of internal and external evidence.

Therefore, the hierarchy of the cognitive domain is constituted by knowledge, comprehension, application, analysis, synthesis and evaluation.

- Knowledge: Under this objective, the processes of recall and recognition are developed with the help of knowledge of facts, events, principles, etc.
- Comprehension: Knowledge is necessary for comprehension. The learner is expected to reproduce facts in his own words, and translate or interpret some content material.
- Application: For application of knowledge, it is necessary to have knowledge and comprehension of that particular content. It is only then that the student can apply it in new situations.
- Analysis: It is a comparatively higher ability, it constitutes the breaking up of facts, events, or principles into meaningful parts and establish relationships between different events, principles, etc.

objectives.

The instructional objectives for learning can be classified into three main categories or domains.

3.5.1 *Cognitive domain* 53

Bloom has divided the cognitive domains into six categories on the basis of complexity and hierarchy of mental functions. This categorization proceeds from simple to complex acts, i.e. knowledge, comprehension, application, analysis, synthesis and evaluation. He further divided these into sub-categories. Knowledge comes at the lowest level of objectives. In connection with the cognitive domain, Bloom says "it includes those objectives which deal with recall and recognition of knowledge and development of intellectual abilities and skills".

- At lower level: It includes knowledge of facts, specifics, principles, terms, trends, classes and classification, criteria and methodology, knowledge of universals and abstracts of theories and structures. Comprehension includes understanding, translating and interpreting.
- At medium level: There is application of knowledge in different situations, and analysis of elements, relationships and principles.
- At high level: There is synthesis which means production of something unique, or production of a plan, and evaluation which means judging in terms of internal and external evidence.

Therefore, the hierarchy of the cognitive domain is constituted by knowledge, comprehension, application, analysis, synthesis and evaluation.

- Knowledge: Under this objective, the processes of recall and recognition are developed with the help of knowledge of facts, events, principles, etc.
- Comprehension: Knowledge is necessary for comprehension. The learner is expected to reproduce facts in his own words, and translate or interpret some content material.
- Application: For application of knowledge, it is necessary to have knowledge and comprehension of that particular content. It is only then that the student can apply it in new situations.
- Analysis: It is a comparatively higher ability. it constitutes the breaking up of facts, events, or principles into meaningful parts and establish relationships between different events, principles, etc.

- Synthesis: It involves creating something new or giving a new shape to knowledge. It develops creative abilities.
- Evaluation: This is the highest level of the objective of cognitive domain, in which facts, events and principles etc. are critically evaluated in terms of internal and external criteria.

3.5.2 *Affective domain.*

The objectives of affective domain are concerned with development of interests, attitudes and values and individual minor feelings and experiences. At the lowest level there is attention and at the highest there is formation of attitude. Detailed categorisation is given below:

1) *Receiving (Attending)*
This is the lowest kind of objective in the affective domain in which the learner is provided with initial experience to show willingness to receive and is given controlled selected attention. For example, the response given by the teacher.

2) *Responding.*
This is the second objective in which paying attention is necessary. The students pay attention to say, a recited poem, and are willing to respond and derive satisfaction from giving response to questions.

3) *Valuing*
Receiving and responding help in the achievement of this objective which is exhibited in the behaviour of the individual in the form of acceptance and preference for a value and commitment to it.

4) *Organization.*
After the acquisition of values the individual conceptualizes the correct nature of different values, and organises them into a value system which helps in the development of attitudes.

5) *Characterization of value complex*
This is the highest kind of objective in the affective domain which is based upon the four objectives described earlier. At this stage a permanent value complex or system is formed in the individual which is reflected in his interests, attitudes and life style.

3.5.3 *Psycho motor domain*

This domain relates to the development of physical skills. A detailed and standardized taxonomy of the psycho motor native domain objectives is yet to be evolved. However, Prof. Simpson, Prof. Harrow and Prof. Dave have tried to categorize this objective on the basis of muscular actions. However, the categories given by Prof.R.H.Dave are more popular, acceptable and are commonly used. Hence, only these categories in hierarchical order are described below:

i) Imitation: This category is of the lowest kind in which mental impulsion provides the base and the individual repeats the overt act in crude form.

ii) Manipulation: At this stage the individual follows directions, selects certain acts, and the process of fixation starts.

iii) Precision: This is the third stage at which the individual reproduces the desired act and gains necessary control over it.

iv) Articulation: At this stage, the individual acquires the skill of controlled presentation of different acts in a coordinated manner, in proper sequence and harmony.

v) Naturalisation: This is the highest kind of objective in psycho motor domain in which the desired acts turn into automatic acts leading to a sort of habit formation or routine acts for the individual.

For further detail, please read the below referred material.

Das, R.C. (1993)	Educational Technology: A Basic Text, New Delhi, Sterling Publishers (Private) Limited. PP.133-144.	3-3

3.6 WRITING EDUCATIONAL OBJECTIVES IN BEHAVIOURAL TERMS

Educational objectives need to be specified in terms of pupil's behaviour to make the process of teaching-learning more purposeful and effective. The statement of educational and instructional objectives consists of the following two parts:

- The first relates to the changes that are to be brought about in any aspect of behaviour of the learner.
- The second relates to the content material or syllabus (curriculum in general) to be covered through instruction which is expected to modify the behaviour of the learner.

Therefore, the following three things are to be kept in mind while writing educational objectives in behavioural terms.

i) Nature of instructional objective (knowledge application etc)
ii) Area or domain or behaviour (cognitive, affective or psycho motor).
iii) Specific content area.

There are three main approaches in writing objectives in behavioural terms.

3.6.1 *Robert Mager's approach*

Robert Mager (1975) has adopted Bloom's Taxonomy for writing objectives. Various action verbs have been used to state the objectives in behavioural terms. A list of action verbs has been suggested. Mager has suggested the following steps while writing the objectives.

- Identification of terminal behaviour: What the pupil will be able to do after teaching.
- Describing the important conditions under which the desired behaviour change is expected to take place.
- Specification of criteria of acceptable performance or desired terminal behaviour.

List of action verbs for cognitive domain objectives.

Objectives	Associated Action Verbs
Knowledge	Define, state, recall, recognize, write, select, measure, list, etc.
Comprehension	Explain, identify, classify, distinguish, illustrate, indicate, justify, summarize, etc.
Application	Use, construct, demonstrate, compute, discover, illustrate, modify, solve, select, etc.
Analysis	Analyse, compare, conclude, contrast, criticise, differentiate, separate, etc.
Synthesis	Organize, discuss, argue, integrate, generalise, prove, relate, summarise, predict, etc.
Evaluation	Compare, choose, associate, criticize, conclude, defend, evaluate, support, verify, etc.

For example: Statement of objectives in behaviour terms for teaching "Noun" in English.

(a) Knowledge: The pupils will be able to define "noun". The pupil recognises or selects "noun"
(b) Comprehension: The pupil will be able to distinguish, 'noun'. The pupil identifies 'noun'.
(c) Application: The pupil will be able to use 'noun' i.e. in a sentence. The pupil constructs sentence using a 'noun'.

Robert Mager has suggested the following list of action verbs of affective domain.

Objectives	**Associated Action Verbs**
Receiving	Accept, attend, ask, observe, follow, prefer, catch, discover, favour, select, etc.
Responding	Listen, answer, complete, develop, help, obey, record, practice, write, state, list, etc.
Valuing	Accept, choose, discriminate, develop, influence, attain, complete, prefer, participate, etc.
Organizing	Select, prepare, add, associate, complete, coordinate, correlate, find, form, integrate, etc.
Characterizing	Change, accept, decide, characterize, prove, judge, revise, verify, discriminate, etc.

Examples of affective domain objectives written in behavioural terms in the subject of social studies:

1) Receiving: The pupil accepts the duties of a citizen.
The pupil likes or follows duties of a citizen.

2) Responding: The pupil writes/states duties of a citizen.
The pupil records or lists duties of a citizen.

3) Valuing: The pupil prefers or chooses duties of a citizen.
The pupil accepts or discriminates between duties of a citizen.

4) Organising: The pupil selects/completes duties of a citizen.
The pupil prepares or integrates duties of a citizen.

5) Characterizing: The pupil changes/revises duties of a citizen.
The pupil judges/verifies duties of a citizen.

The limitations of Robert Mager's approach are as under:

- It concentrates in cognitive and affective domains and ignores the psycho motor domain;
- It's behavioural approach is limited to stimulus-response type of learning only;
- It emphasizes action verbs ignoring the mental process;
- There is overlapping in action verbs creating confusion; and
- The list of action verbs is too long.

3.6.2 *Harrow, A.J. Approach*

Robert Mager ignored the psychomotor domain. Harrow (1972) emphasized the psycho motor domain and suggested the following procedure/steps in writing objectives.

- Describing the indicator or indicating relevant activity.
- Describing the stimulus which calls for a response.
- Describing the controlling of object.
- Describing the activity to be done.
- Indicating the adequacy of response for feedback.

List of verbs for psychomotor domain.

	Objectives	**Associated Action Verbs**
1.	Reflex movement	Stop, straighten, stretch, loosen, etc.
2.	Fundamental movement	Catch, hold, jump, move, kneel, run, walk, etc.
3.	Physical abilities	Bend, bear, conduct, start, lean, etc.
4.	Perceptual abilities.	Balance, discover, explore, identify, see, etc.
5.	Skilled movements	Dive, drive, dance, play, skate, shoot, swim, etc.

6.	Non-discussive communication	Pose, sit, sketch, smile, stand, etc.	
	Examples:	1)	The pupils stretch their arms.
		2)	The pupils jump a particular height.
		3)	The pupils bend or lean as directed.
		4)	The pupils balance their bodies on one leg.
		5)	The pupils dive or dance as directed.
		6)	The pupils stand still.

From the above discussion, it is clear that the criteria for well defined objectives involves:-

1) Specifications of the learner.
2) Specification of the learner's performance in observable behavioural terms.
3) Specification of conditions in which a learner's performance takes place.
4) Specification of minimum expected level of performance of the learner.
5) Objectives should cover all the three domains, as well as different levels of learning outcomes.
6) Instructional objectives should suit a particular content area and vice-versa.
7) Instructional objectives, learning experiences and evaluation should constantly influence and interact with each other to improve the process of teaching-learning.

Phil Race (1989; PP. 39-40) gave the following suggestions to be kept in mind while writing the objectives especially for the distant learner. These includes:-

1) Do not list too many objectives at a time.
2) Do not just list objectives. Cross-reference them.
3) Make them personal.
4) Avoid unnecessary jargon.
5) Relate them to the experience of learners.
6) Make them specific enough.
7) Avoid vague words like "know" and "understand".
8) Make them motivating and attractive.
9) Point out to learners the important objectives.

10) Mention the tough ones.

11) Return to the objectives by reminding the learners of the things they have mastered.

12) Make the objectives match assessment requirements.

For further detail, please read the below referred material.

Rashid, Muhammad (1992)	Staff Development Handbook, 2nd ed. Islamabad, AIOU. PP. 77-80	3-4

3.7 ACTIVITIES

1) Write below a working definition of behavioural objectives.

_____

_____

_____

2) Discuss the importance of objectives in teaching learning process with any educationist of your area and prepare a report of the outcome of your discussion.

3.8 EXERCISE

Hopefully, you have read the whole unit, now please answer the following questions.

Q.No.1 Discuss the significance of objectives in teaching learning process.

Q.No.2 Explain the terms aims, goals and objectives. Also give definitions of each by referring to the author.

Q.No.3 Discuss the importance of using behavioural objectives for developing learning aids and particularly teaching subject matter.

Q.No.4 Discuss the hierarchy of objectives.

Q.No.5 Describe the type of information required for a clear objective.

Q.No.6 Discuss the advantages of writing behavioural objectives from the trainee and instructor point of view.

Q.No.7 Differentiate between general and specific objectives. Give examples in support of your answer.

Q.No.8 Discuss the verbs to be used and to be avoided while writing behavioural objectives.

Q.No.9 Describe Gagne's category of educational objectives.

3.9 BIBLIOGRAPHY

1. Bloom, B.S.(1956) Taxonomy of Educational Objectives: Cognitive Domain. New York: Mckay.

2. Davies, I.K.(1971) The Management of Learning. London: McGraw-Hill.

3. Davies, I.K.(1976) Objectives in Curriculum Design: London McGraw-Hill.

4. Das, R.C. (1993) Educational Technology: A Basic Text, New Delhi, Sterling Publishers Private Limited.

5. Harrow, A.J.(1972) A Taxonomy of the Psychomotor Domain. New York: David McKay.

6. Mager, R.F.(1975) Preparing Instructional Objectives. Belmong California: Ferron Publishers Inc.

7. Race, P.(1989) The Open Learning Handbook. London: Kogan Page.

8. Rashid, M (1992) Staff Development Handbook, 2nd ed. Islamabad, AIOU.

9. Rowntree, D (1974) Educational Technology in Curriculum Development, London, Harper & Row, Publishers.

10. Rowntree, D (1988) Educational Technology in Curriculum Development, 2nd ed. London, Harper & Row, Publishers.

Unit No.4

THEORIES OF INSTRUCTION

By
Dr. Muhammad Rashid

4.1 INTRODUCTION

Teaching is both a sincere and an art has come to acquire its own concepts. Generally it is said that till now we could not form a systematic concept of teaching. The reason being that we treated teaching and learning as two different aspects of education. But, now both are considered as inter-related and intimately connected, so much so that a new concept of the Theory of Instruction had to be evolved. Following are the plus points of evolving a theory of instruction.

1. To help the teacher to understand the nature of instruction so that he may be able to generate appropriate learning situations.

2. It explains the relationship and role of different variables in the instructional process.

3. It epitomises the relationship between teaching learning and identifies common factors.

4. It helps in developing a design for instruction.

5. It provides a scientific way for planning, organizing and evaluating instruction.

6. It helps in studying classroom problems scientifically.

7. It helps pupils and teachers in developing instructional skills.

8. It helps in achieving teaching objectives and better results.

9. It provides knowledge about the assumptions of instructional activity.

For developing a theory of instruction the following points should be borne in mind:-

(a) Instruction is both an art and a science. So, the elements of instruction must be analysed to understand its nature.

(b) Education is a separate discipline today. Hence, it is essential for educationists to evolve theories of instruction rather than theories of learning.

(c) Cronbacht is of the view that theories of instruction cannot be based on theories of learning. Instructional activities facilitate learning situations.

(d) In the opinion of Robert M. Gagne, conditions of learning are the basis of instruction. The task of instruction is to generate learning conditions.

(e) Models of instruction are the initial stage of theory of instruction. The instructional models are philosophical as well as psychological. Therefore, theories of instruction may be in accordance with the instructional models.

Gagne says "A theory of instruction should answer three questions: how teachers behave, why they behave as they do, and with what effects. it should be a general concept which applies to all teachers, to all students, to all subject matter, and to all situations, both in and out of school, in which teaching may occur. It should consider the behaviour of teachers, and the learning of students. And it should explain, predict and control the ways in which the behaviour of the teacher affects the learning of the students."

Bruner (1964) observes that theory of instruction is the explanation of "general methodology of instruction".

Kerlinger (1965) has defined the term theory of instruction, as "a theory of instruction is a set of inter-related constructs, definitions, prepositions which present a systematic view of instruction by specifying relations among variables with the purpose of explaining and predicting instruction." Here the main emphasis has been laid on the relationship among instructional variables. The purpose of relationship is to understand, predict and control instructional tasks.

4.2 OBJECTIVES

After reading the unit, the student should be able to:-

1. develop a student learning profile;
2. discuss instructional strategies;
3. explain the techniques of motivation in the instructional process;
4. identify the instructional processes for motivation; and
5. differentiate among the individual instruction, group instruction, simulated instruction and inter-active instruction.

4.3 DEVELOPING OF LEARNERS PROFILE

A learner's profile means what students are like as learners and what their

learning atmosphere is like. Obviously, you know there is a lot of difference between learners of urban and rural areas. Urban learners normally have more facilities than the rural ones. They may have access to libraries, electricity and higher level of schooling than the rural ones. As a writer of distance education course one has to list the things that describe learners, such as basic data, life styles, infrastructure and study habits.

You must also consider the basic data of your target population such as their sex, age group, rural and urban division, level of literacy, primary learning needs. Under their life style one must know about housing conditions, nature of work and working hours (if applicable), financial position, habit patterns, attitudes and aspirations and the extent of understanding of non-oral communication. Likewise, under infrastructure, the writer must be aware of the learners' house facilities (i.e. water, electricity, gas, drainage etc), local facilities and finally the facilities available at the regional and national level. The writer must also know about the study habits of his learners.

4.3.1 *Use of Learner Profile*

In formal systems of education most teachers are aware of about their learners' abilities and study conditions. In distance education, it is necessary for a writer to know a lot more about the learners. He has to think about their age, their literacy level and knowledge of the subject to be taught. Nothing can be assumed about the learners unless and until a clear picture of their study atmosphere is available.

Learner's profile can be used at two levels - policy level and design level. At the policy level you can ask yourself if the learners generally have access to telephone. If not then, of course, you will not use it as a means of tutor contact. Likewise, if the learners have access to television you can use it as a teaching medium. Such decisions need to be made in the beginning of a course design even in distance education system. At the design level, you must have an idea whether the learners know something about the topic you want to teach. Having all the information about the prospective student would certainly make the distance teaching approach more effective.

4.3.2 *How to draw Learner Profile?*

As mentioned earlier, in drawing up a learner's profile, the writer must have the information of his target population. Four major areas are needed to be considered:

1. Basic data - rural/urban division, sex, age group, employed or un-

employed, their level of literacy and what basic knowledge the learners have.

2. Life style - learner's housing conditions, their working hours, financial position, mode of travel, their non-work activities, attitudes and aspirations and non-oral communication.
3. Infrastructure - electricity, water, gas, postal services, telephones, school buildings, number of classrooms, roads and availability of library.
4. Study habits.

For drawing a good profile of a learner, all the above points need to be considered carefully.

4.3.3 *Relevance of Learner Profile Variables to Designing of Material*

It is, indeed, very difficult to make a universally accepted standard of learners profile for the design of material. You have to generate as many details (or variables) as you can think and then select those which you think are relevant to your particular teaching situation.

For your convenience some variables are highlighted along with their relevance specific to designing of distance education materials.

We have divided such possible variables into three categories - study environment (direct and indirect relevance), study conditions (learner skills) and study conditions (psychological). Examples are given below in respect of the three categories.

Example-1 Suppose there is a variable of conveniences in a study environment where the learner has no electricity and tables. What will be the relevance of this variable to material designing?

Relevance You have to propose study hours either in the afternoon or early morning. The homework can be completed by the learner by either putting the books on his knees or on the floor.

Example-2 Say the learner is in a location where there is no study centre, and contact with other learners is also limited. Only the headmaster of a nearby school can be helpful. What will you recommend while designing your course?

Relevance	In this situation, there is need to develop the correspondence materials in highly illustrative way having a lot of explanation. In this situation some opportunity of discussion with a staff member of a nearby school as to what to put in the text will be useful.
Example-3	Suppose the learner is immature and dependent and not able to organize his study, what relevance does maturity have in designing a material for distance education?
Relevance	In such a situation, the writer must give instructions on how to study.
Example-4	Say the learner feels slightly inferior being unable to get employment on leaving school, how will you develop his confidence?
Relevance	Try to build confidence of the learner by prescribing very easy activities and give him a clear indication of what he has achieved. In this regard matching activities are quite useful being clear and comprehensible to the learner.

Anyhow, learners are highly dependent and normally work hard if properly instructed. They are unlikely to have any initiative. The correspondence materials must be completely self-contained as the learners have no access to libraries or other assistance.

The material should be well structured with precise instructions on what the learner has to do. The text should have self-assessment questions and bibliography. It should be written in easy and simple language.

For further details, please read the below referred material.

Taba, Hilda (1962)	Curriculum Development: Theory and Practice, New York, Harcourt, Brace & World Inc. PP.31-46	4-1

4.4 INSTRUCTIONAL STRATEGIES

There are various instructional strategies. Among these the following are important:

4.4.1 *Lecture*

Lecture can be defined as strategy discourse on a subject. The word discourse signifies that one person talks and the others listen. It is one of the collective strategies of teaching and is used quite often especially at the college level of teaching. It is based on the assumption that the student is a passive learner. Lecture is a strategy of exposition, while telling is one of narration.

This strategy is used because of the following objectives:

i) To clarify: This strategy is a group strategy, and when a large number of pupils need clarification in moments of difficulty, this strategy comes handy. A few minutes of lecturing can remove their doubts.

ii) To expand contents: In books many things remain unsaid. There is a world beyond textbooks, and pupils are interested to know about those things. Sometimes the discussion in a book about a topic is not sufficient. We can use lecture strategy as a supplement.

iii) To review content: This is expansion of the supplement lecture strategy. It is also useful in recapitulatory work.

The lecture strategy has the following characteristics and advantages.

i) The chief characteristic of this method is that it is probably the most efficient strategy for presenting a large number of facts in a short period of time. Time stands saved.

ii) It is useful in introducing new subjects, in summarizing the literature in a field, in rec-capitulating course work, etc.

iii) With the help of this strategy, the teacher can correct speech defects. He can teach right pronunciation to children and adults alike, provided his own pronunciation is not faulty. It does inspire bright students.

iv) It adds life to those ideas which appear to be dull, difficult and cold in the book and which the students like to skip over. How to do that depends upon the teacher who must have the capacity to impersonate, narrate and inspire students.

Following are the disadvantages of lecture strategy.

i) One way process: The lecture is largely a one way process. there is not much interaction between the students and the teacher.

ii) Ignores Individual differences: Many in the class may not follow

iii) Lack of consideration for interests & abilities of students: It does not take into consideration the interests, abilities and needs of the students as individuals.

iv) Monotonous and boring: If the teacher is not alert and does not strive hard, the lecture will become monotonous, boring and ineffective. It does happen in many cases.

v) Substitute for a book: Lecture tends to substitute the teacher for the textbook, and then many students do not bother to read books. It is a wrong approach. A teacher cannot present all that is in a particular book or in a number of books.

The following points must be taken care of when lecturing in the class.

i) Lecture must be well organized and well prepared.
ii) It should contain sufficient examples.
iii) For every generalization, an example should be cited.
iv) The lecture should proceed from simple to complex.
v) The main points must be clearly brought about.
vi) If it is humorous and wity the audience will not be bored.
vii) A lecture must have a question-answer session.

After preparing the students, and announcing the aim of the lesson, the teacher should start his presentation. He should use a number of teaching devices like questioning, narration, explanation, audio-visual aids etc, to make various ideas clear to the pupils. Presentation of knowledge should not be a one-way traffic. The teacher is to carry the students with him. He should ensure that the subject matter is understood by the pupils without any difficulty. There should also be some activity. Teacher should try his best to develop and expose the subject matter with the active participation of the pupils. He should bear in mind the following principles for the presentation:

i) The matter to be presented should be wisely selected according to the level of the pupils. It should be further divided into convenient sections.

ii) The teacher must make sure that the pupils follow what he teaches. He should take up the next section of the lesson only when the previous section is clear to the students.

iii) First finish one section of a lesson and then integrate it with what has gone before. In the end, all the parts of the lesson should be integrated to understand the lesson as a whole.

For further details, please read the below given reference.

George Brown and Madeleine A. (1987)	Effective Teaching in Higher Education, London, Methuen, PP.19-43	4-2

4.4.2 *Recitation strategy*

The teacher lectures, students listen and then they recite what they have heard. They quote things back again from memory. This is known as recitation. It is immaterial whether they understand things or not. But as long as materials can be reproduced, the basic requirement of recitation has been met.

The concept of recitation has undergone a change. The old idea of lesson learning has been washed away. In present day teaching, the teacher should raise questions which keep the students active because these involve:

(a) interpretation,
(b) criticism,
(c) supplementing, or
(d) application along the lines studied.

There is no set procedure for recitation. Every teacher will have his own procedure. We can only give some suggestions:

i) Teacher should adopt a favourable attitude. A story can help to create interest and makes recitation easy.
ii) Recitation should be well planned. Movement from phase to phase should take place with precision and naturalness.
iii) Before asking some one to recite, the teacher should discover his adequacy or preparation for the same.
iv) Recitation must come after discussion. All should participate in discussion. Students should be encouraged to contribute something. Teacher should not talk. Let the students talk.
v) Students' co-operation must be sought at every step.

4.4.3 *The Discussion strategy*

Group discussion is now recognized as a basic strategy of education--both for regular students and for adults to a large extent. There are many reasons which supplement this, two of which are:

i) The method helps in "internalising" and using the facts for our sake, which can be collected with the help of other strategies at our disposal.
ii) Children and adults have a rich background of experience on

which the educational process can draw. These experiences are more valid as a source of material for group learning than some abstract textbook.

It has been said: "Discussion is the process whereby two or more people express, clarify and pool their knowledge, experiences, options and feelings. It is a co-operative process in which several minds work together on a basis of equality and mutual respect."

The basic idea of discussion can be combined with other methods to give different variations. Some of those forms or types are:

1) Symposium: In this type of discussion, three or more persons present their views on a several sided question or topic. Each takes a different aspect. It can be followed by questions and discussion. This method provides for greater freedom in audience participation. One precaution to be taken is that all the speakers should be equal ability.
2) Panel discussion: Here a few people with different backgrounds and experience discuss a thing while others listen. They are of course free to get their doubts removed. It requires a skillful moderator to see that the members do not start arguing or making long speeches.
3) Informal group discussion: In this, the pupil is the leader of the discussion activity. Leadership qualities are developed by this method, in which students feel free and easy and their thinking ability is tested. However, the discussion requires careful handling.
4) Formalized group discussion: In this, there is a discussion leader and several resource members who represent special skills and specialized knowledge essential to the problem which the group is discussing. There is also a recorder. The leader keeps the discussion on the track. At intervals, he summarizes it and clarifies the points that have been made. No confusion should prevail.
5) Institutional forms of socialized procedure: It has become popular to cast the class into the many forms of social or administrative organizations that exist in the community - a mock parliament or a simulated party convention. This way, one can get the feeling of democratic limitations.

For further details, please read the below referred material.

Sharma, R.A. (1993)	Advanced Educational Technology, Meerut, Loyal Book Depot, PP.87-108.	4-3

4.5 INSTRUCTIONAL PROCESSES FOR MOTIVATION

Boredom is often a major problem in the classroom and the instructional styles of many teachers do not even recognise this factor. They remain stationary at a place or speak in a monotonous voice throughout. Effectiveness of instructions involve deliberate changing of various attention--compelling behaviours of the teacher in order to maintain pupils' attention at high level.

4.5.1 *Individual Instruction - Teaching Skills*

The behaviours corresponding to the skill can be stated as follow:

a) Movement. Teacher's movement in the class room from one place to another facilitate useful shifts for attention. Such movements must be purposeful. For example, movement towards black-board to discuss a point on it.

b) Gestures. Movements of head, hands and body for more expressive and dynamic presentation; For example, to express emotion, to indicate sizes, shapes, movement, etc.

c) Change in speech pattern. Sudden or radical change in tone, volume or speed of the teacher's speech, modulation of voice, etc., help to avoid monotony.

d) Focussing. Verbal, gestural or verbal-gestural focussing and calling attention to specific material, as "Listen to this," or "Look at this", etc.

e) Change in interaction styles. Instead of teacher monologue, teacher is encouraged to use three patterns of interaction.

- Teacher-Group: Teacher making a dialogue with the entire class which answers questions.
- Teacher-Student: An individual student is asked probing questions.
- Student-Student: One student's response is redirected to another student for comment or clarification.

f) Pausing. Short deliberate intervals of silence used while information is conveyed to pupils, i.e., from oral visual to oral oral-visual to visual oral-visual.

1. *Skill of probing questions.*

When the teacher puts a question to the class, he gets various types of responses from the pupils. In such a situation, when correct responses are not given, the teacher should lead the pupils to the correct response without resorting to punishment. The teacher has to go deep into the pupil's responses or probe into them by asking a number of questions

about what they already know and to lead them to the correct response.

The following are the components of the skill of probing questions:

a) Prompting. Ask questions in which there is a hint for the pupil which helps in reaching the expected response.

b) Seeking further information. Questions where more information is sought, asking how and why of correct or wrong part of the partially correct answer.

2) Refocussing questions. Questions which seek from the pupil to compare the phenomenon with other phenomena for similarity or contrast or for any other relationship.

d) Redirected questions. Questions which are directed to more than one pupil for response.

e) Increasing critical awareness. Questions which require the pupil to rationally justify his response.

2. *Skill of Explanation*

Explanation is a set of interrelated statements made by the teacher, related to a phenomenon or an idea in order to increase understanding in the pupils about it. In order to be a good explainer, the teacher trainee has to develop certain desirable behaviours like using explaining links, using beginning and concluding statements. Side by side he has to avoid undesirable behaviour like irrelevant statement lacking in continuity, or using inappropriate vocabulary lacking in fluency, and using vague words and phrases.

3. *Skill of using blackboard*

Blackboard or chalkboard is one of the most widely used visual aids in a classroom. Very often, it is also misused. Many teachers seem to forget the availability of a versatile tool close at hand. The components of the skill of using blackboard are (a) writing legibly on the blackboard, using different letters which are large enough to be read by pupils with adequate space in between the letters; (b) neatness on blackboard work which can be achieved by retaining only the matter under focus and by seeing that there is no overwriting; and (c) appropriateness of written work in respect of meaning, brevity, simplicity and continuity in the points being presents. Also useful in underlining important words using coloured chalks, and developing necessary proportionate diagrams along with the lesson.

4. *Skill of Reinforcement*

All pupils in a class need social approval of their behaviours. When they are answering a question, they are eager to know whether their answers are correct or not. When they are appreciated for a correct answer, they are eager to respond correctly and get the result of positive reinforcement. Reverse is also true. They can be discouraged by a teacher's behaviour. This skill must have the following components: Using verbal reinforcers, repeating and rephrasing the pupil's answer, using extra-verbal cues like "well done!" to encourage pupils while answering, and writing pupil's answers on the blackboard. These are positive reinforcers. On the other hand, a teacher should avoid using negative verbal reinforcement, or negative non-verbal reinforcement. Only positive reinforcement should be used.

In order to have full details about effective teaching skills for motivating the learners, please read the below mentioned material.

Aggarwal, J.C. (1995)	Essentials of Educational Technology: Teaching learning Innovations in Education, New Delhi, Vikas Publishing House Pvt. Ltd. PP.251-274.	4-4

4.5.2 *Group Instruction*

This is a student centered strategy in which pupils are divided into groups and they are encouraged to discuss a given subject matter. This approach is also called discussion approach. However, it is of two types (i) By the teacher (2) by the student.

By the Teacher: Group discussion is dominated by the teacher. Classroom climate is autocratic, and most of the time, the teacher is active and the students accept his ideas and views.

By the Student: After giving a lecture, the teacher, encourages the students to participate in group discussion. He supervises them and provides guidance to make the discussion fruitful.

Group instructions are based on the following principles. (i) Principle of active participation.(ii) Principle of learning by listening. However, the main focus is to achieve higher order of cognitive and affective objectives.

There are formal and informal forms of groups instruction. Informal discussions, the matter to be discussed is highly structured. Proper schedule is prepared and certain rules are followed. Teacher acts

as leader of the group.

On the other hand, in informal discussions, the subject matter to be discussed is not instructured. No fixed schedule is prepared and no rules are to be followed. An outstanding student is selected as leader by the group of students. He plans the discussion and leads it. The teacher is passive and merely supervises the students involved in the discussion.

The following steps are required for planning of group discussion.

1. Topic is decided for discussion.
2. Objectives of discussion are decided.
3. Time limit is fixed.
4. Weightage points are decided.
5. Penalty points are also decided.

Group instruction/discussion has the following advantages.

1. Affective and higher level of cognitive objectives are achieved.
2. It helps in developing self-confidence among the learners.
3. It induces comparative discussion on favour and disfavour basis.
4. It provides freedom for expression to the learners.
5. It develops the habit of co-operation.
6. It also promotes the habit of listening one's views being criticized.
7. Learners try to reach a conclusion with the help of team-spirit and co-operation.

Group instruction/discussion has the following advantages.

a) Group discussion cannot be used for basic teaching strategy, but it can be used as a supplementary technique after lecture and demonstration.

b) It is quite time-consuming. So, the teacher must fix a time schedule for discussion to make it a purposeful activity.

c) It can only be applied to average and above average students. So, it is the teacher's duty to form groups on the basis of some criteria of intelligence and abilities. He should provide them topics accordingly, so that students of low intelligence and abilities can also be benefited.

d) If a group discussion/instruction is not properly organized, it may create disaffection against the teacher and the whole exercise may be a waste of time. So a teacher must plan the discussions beforehand to avoid embarrassment to anyone.

For further details, please read the below referred material.

Henery Ellington, Fred Percival and Phil Race (1993)	Handbook of Educational Technology, 3rd ed. London, Kogan Page Ltd. PP.103-120	4-5

4.5.3 *Simulated Instructions*

There are five skills which K. Sampath and his associates (1994) considered important. Simulation means to copy. It is another innovation in teacher education.

Simulation offers opportunities for compensating the trainee for lack of actual time spent in practice teaching. Simulation is a "controlled representation of reality involving role playing" and "a simplified but minimally distorted reflection of class teaching."

Some other definitions of simulated teaching and simulation are as under:

1. Dictionary meaning: "Simulation is defined as giving the appearance of or effect of, to have characteristics of."
2. Tansy's definition, "Simulation is the all-inclusive term which contains those activities which produce artificial environments or which provide artificial experiences for the participants in the activity. It is reproduction of the reality."
3. View of Fink, "Simulation is the controlled representation of reality."

There are three important ingredients of simulated teaching.

1. Simulated teaching implies an analysis of the teaching act and of the teaching learning situation from the point of view of the learner.
2. It is made of the actual role-playing operation by the teacher.
3. Evaluation of the effect of simulated teaching is the third property of simulation. If the teaching behaviour does show some changes in the structuring devices of the practising teacher, it may be considered to be the effect of simulation practice.

Simulated teaching is a teacher training system based on the technique of simulation. This could present the student will upto thirty-one different simulated problems related to teaching. The aim of 'Teaching Problem Laboratory' is for the participant to assume the role of teacher and to practise solving the teaching problems he has identified.

Simulation technique is usually employed before sending the student teachers to actual teaching practice. Concrete examples of teaching problems and activities are presented in a structured way so that the student teachers are able to abstract the common general features from the

specific examples. Simulation technique, thus, helps in developing requisite skills of teaching in them.

According to Rowntree, (1988) there are three roles:- 1. the teacher, 2. the pupil. 3. the observer; and three elements: 1. diagnosis, 2. prescription, and 3. evaluation in the Simulation Training Techniques.

The following steps or procedure have been recommended in simulated teaching:-

1. A small group of pupil-teachers is selected. They are assigned different letters in an alphabetic order such as A through D or E. The role assignments are rotated within the group to give chance to everyone. Thus every member of the group gets an opportunity of playing the role.
2. The skills to be practised are discussed and the topics that fit in the skills are suggested. One topic each is selected by the group members for exercise.
3. This refers to deciding who starts the conversation, who will intervene, who will stop the interaction and when it will be stopped and so on.
4. This step is undertaken to speculate the procedure of evaluation and deciding what kind of data and opinions can best be presented to the actor when the interaction stops.
5. First the practice session is conducted and the actor is provided with feedback on his performance. As soon as the practice sessions are working smoothly, and each person has had an opportunity to be actor, the task should be made more difficult.
6. Be prepared to change the procedure, change the topics and move on to the next skill, so as to present a significant challenge to each actor and to keep the interest to the maximum.

The merits of simulated teaching are:

1. Simulated teaching is between theory and practice.
2. It is an innovation. It keeps one motivated and amused.
3. As a result of role playing, critical thinking is developed in the students.
4. Simulated teaching is a social laboratory. It leads to the development of social skills.
5. The behaviour problems of the class are better understood.
6. New vistas for teaching and learning are opened.

Following are the demerits of Simulated Teaching.

1. Simulated teaching is away from reality. In face, all of it is a copy of reality.
2. It requires a lot of preparation on the part of teachers.
3. It can be a sheer waste of time if not properly executed.
4. The feedback provided is not total but only the most likely.

For further details, please read the below referred materials.

Aggarwal, J.C. (1995)	Essentials of Educational Technology: Teaching learning Innovations in Education, New Delhi, Vikas Publishing House Pvt. Ltd. PP.275-283.	4-6

4.5.4 *Inter-active Instruction*

In interactive instructions, the teachers should recognise that the class is a group constituted by pupils from various social, economic and religious backgrounds. These students interact first with one another, and secondly with the teacher. If a teacher does not know how his students have to behave amongst themselves, or with reference to him--he simply cannot teach. Amongst the group will always be some who are aggressive, others are naughty and still others timid and shy at the mercy of the bullying, ones. Some will like the teacher and others will detest him. The task of the teacher thus is to know who behaves in what manner and then only his education/teaching will be effective. The results of classroom interaction also get reflected in the society. The society will know the rebel of tomorrow by simply watching the students' behaviour today in the classroom. It will also tell about social adjustments. We simply cannot imagine class without interaction. The interaction will also help the teacher to correct himself if the learning benefits are to be maximum. Hence the concept and the importance of classroom interaction. There are many factors on which classroom interaction depends. Important ones are:

1. Socio- economic status: This means the socio-economic status of the parents. Poor children react adversely to the ones coming from richer families and those with social influence. They tend to form their own eliques.
2. Intellectual level of child: It is second important factor governing classroom interaction. The intelligent child has his own company, but whenever a less intelligent or backward child seeks his help it is readily given. Intelligent children like to help their weaker brethren. There are only few intellectual snobs.

3. Sex: It is a factor only in co-educational institutions. Upto secondary stage, boys and girls live in groups of their own. At the university stage, mixing begins. Teachers are not without the influence of sex. Male teachers are partial toward girl students. This leads to indiscipline sometimes.
4. Interest and Aptitude: Games are responsible for interaction at the lower level or in lower classes, but then at a higher age, friendships are formed on the basis of interests and aptitudes. Even relationship does not help. Two brothers having like interests or aptitude will have different sets of friends.
5. Common Interest: Enemies unite when their interest is common. Students who otherwise are hostile can join together against a bad teacher. So common interest is an important factor.
6. Teaching as interaction/Flanders teaching: Classroom teaching is an interactive process in which a teacher tries to influence the students represented in a group. The influence is not only one way. Both teachers and the students influence each other. Flanders (1959) has attempted to reduce the whole teaching act in terms of verbal interaction. The entire verbal interaction in a classroom has been put into two broad acts--silence and talk. Talk has been further sub-divided into two--teacher-talk and student-talk. Under Flanders system there are two categories in student-talk and there are seven categories in teacher-talk. Teacher-talk categories are further sub-divided under direct and indirect patterns of influence. For direct pattern of influence there are three categories, and for indirect pattern of influence there are four categories. Thus classroom interaction can be studied under ten categories following the Flanders system. The ten categories that are used for interaction analysis are given below.

Teacher Talk--Indirect Influence

1. Accepts feeling: Accepts and clarifies the feeling tone of the students in a non-threatening manner. Feeling may be positive or negative, and includes predicting or recalling feelings.
2. Praises or Encourages: Praises or encourages the students' actions or behaviour. Jokes that release tension, not at the expenses of another individual, nodding head or saying, "un hm" or "go on" are included.
3. Accepts or uses idea of student: Clarifying, building or developing ideas suggested by a student. As the teacher brings more of his own ideas into play, he shifts to category five.
4. Asks question: Asks a question about content or procedure with the intent that a student answers.

5. Lecturing: Gives facts or opinions about content or procedure, expressing his own ideas, asking rhetorical questions.
6. Giving directions: Directions, commands, or orders with which a student is expected to comply.
7. Criticizing or justifying authority: Statement intended to change student behaviour from non-acceptance pattern bowling some one out: stating why the teacher is doing what he is doing: extreme self-reference.
8. Student talk-response: Talk by student in response to teacher. Teacher initiates the contact or solicits student's statement.
9. Student talk-initiation: Talk by students which they initiate. if "calling on" student is only to indicate who may talk next, the observer must decide whether student wanted to talk or not.
10. Silence or confusion: Pauses, short periods of silence and periods of confusion in which communication cannot be understood by the observer.

The observer sits in a classroom in the best position available so that he hears and sees the participants. At the end of each second he decides which category best represents the communication events just completed. He writes this category's number while simulatenously assessing communication in the next 3 seconds. Thereby, the observer works at a rate of 20 to 24 observations per minute. As soon as the total observation is completed, the observer goes to a nearby room and completes a general description of each separate activity period. Then 10x10 interaction matrix, as suggested by Flanders, is completed and the results interpreted.

This technique is very useful in teacher education programmes where pupil teachers can be observed while teaching and enable them to improve their skill. The pupil teachers shall learn to control their own behaviour for the professional purposes of managing effective classroom learning. It is the duty of the teacher-educator to help prospective teachers discover what their teaching intention should be, and create training situations in which the behaviour gradually matches intentions with practice. The system of Flanders' interaction analysis also suffers from many limitations. Only a few are mentioned here. This system is not a perfect system. It does not take into consideration the totality of classroom situations. It is possible that some unrecorded aspects of the teaching act may be more important than the recorded ones.

For further details, please read the below referred material.

Don. F.Seaman and Robert A. Fellenz (1989)	Effective Strategies for Teaching Adults., London, Merrill Publishing Company, PP.119-145.	4-7

6.6 ACTIVITIES

1. Draw a flow chart for developing learner profile by indicating all the possible essential steps.

2. Discuss the instructional strategies with your colleagues in the study centre and prepare a note on the best instructional strategy.

3. Write below the important steps required for student motivation.

_____

_____

_____

4. Write down the instructional process which you think is more appropriate for secondary schools of Pakistan.

_____

_____

_____

6.7 EXERCISE

Hopefully, you have studied the unit, now please answer the following questions.

Q.No.1 How you will develop a learning profile before providing instructions to the students?

Q.No.2 Discuss the essential components required for developing a student's learning profile.

Q.No.3 Critically examine the instructional strategies. Which strategy do you think more appropriate for teaching-learning process in Pakistan.

Q.No.4 "Lecture is defined as strategy discourse on a subject where one person talks and the others listen." Discuss.

Q.No.5 Discuss the advantages and disadvantages of lecture strategy.

Q.No.6 While lecturing in the class which measures are essential for the teacher? Discuss.

Q.No.7 Describe the recitation strategy.

Q.No.8 Critically examine the discussion strategy in the teaching-learning process.

Q.No.9 Define motivation. Also discuss the methods of motivation which make the teaching-learning process more effective and efficient.

Q.No.10 Discuss the instructional processes in teaching.

Q.No.11 Explain the theories of instruction in teaching.

Q.No.12 Explain teaching. Discuss various phases and operations of teaching.

Q.No.13 What do you understand by operations of teaching? Give importance of these operations in education and training.

Q.No.14 Write a short note on the followings:

1. Individual instruction.
2. Group instruction.
3. Simulated instruction.
4. Inter-active instruction.

6.8 BIBLIOGRAPHY

1. Aggarwal J.C.(1995) — Essentials of Educational Technology: Teaching Learning Innovation in Education, New Delhi, Vikas Publishing House, Pvt. Ltd.

2. Don F. Seaman and Robert A. Fellenz (1989) — Effective Strategies for Teaching Adults, London, Merrill Publishing Company.

3. George Brown and Madeleine A.(1987) — Effective Teaching in Higher Education London, Methuen.

4. Henery Ellington, Fred Percival and Phil Race (1993) — Handbook of Educational Technology, 3rd ed. London, Kogan Page Ltd.

5. Rowntree Derek (1988) — Educational Technology in Curriculum Development, 2nd ed. London Paul Chapman Publishing Ltd.

6. Sampath, K. A Panneerselvam and S. Santhanam (1994) — Introduction to Educational Technology, 3rd ed. New Delhi, Sterling Publishers, Private Limited.

7. Sharma R.A.(1993) — Advanced Educational Technology, New Delhi, Meerut, Loyal Book Depot.

8. Taba Hilda (1962) — Curriculum Development: Theory and practice, New York, Harcourt, Brace and Warld Inc.

Unit No.5

INSTRUCTIONAL MEDIA

By

Dr. Muhammad Rashid

5.1 INTRODUCTION

Instructional aids are used by all good teachers. They are also called audio-visual aids. These aids help provide experiences similar to direct and purposeful experiences which are not always received by the students. The teacher's business is to help the student to draw out the best in himself and make it perfect (Sri Aurobindo, 1972). During the process of attainment of perfection, the student, in order to learn effectively, must understand the lessons taught by the teachers. Teaching mainly consists of lectures by teachers. If the students are not mindful, the lectures are wasted. Instructional aids help in securing attention of the students. They also impart variety to teaching styles, and break the monotony of the methods of teaching. These aids not only promote better understanding of the lessons, but also help the students in retention of knowledge.

All good teachers use these aids for improving the quality of their teaching. There are various types of aids. Each aid has its specific functions, and its advantages and limitations. The teacher has to know these functions in order to understand their relevancy in different teaching-learning situations. An aid cannot be applied arbitrarily. It has to be applied at proper place, at proper time and in proper manner. Their applicability also depends on their availability. Good teachers do long term planning and try to use proper aids by borrowing them from other sources, if not available in their own schools or in a nearby community. There are instances of non-use of aids, mostly due to ignorance of teachers. Hence knowledge about instructional aids is a must for every sincere teacher.

5.2 OBJECTIVES

After studying the unit, it is hoped that the student will be able to:-

1. explain graphic aids like maps, pictures, charts, graphs, globes and diagrams;

2. discuss the utility of chalkboard/blackboard, bulletin board and flannel board in the teaching learning process;

3. appreciate the utility of models, posters, filmstrip, projectors, slide projectors, epidiascope, overhead projector and microfiche;

4. specify the significance of field trips and excursions;

5. describe the role of exhibits in education;

6. specify the utility of museums in education;

7. discuss the role of educational radio and T.V;

8. identify the role of tape recorder and record player in education;

9. state the potential advantages of V.C.R;

10. evaluate the advantages of video disc;

11. discuss the role of language laboratory in teaching and learning process.

5.3 GRAPHICS AIDS

5.3.1 *Charts*

Charts are very useful in the teaching of all subjects and can be prepared or purchased in the market. The pictures drawn on the chart should be cleared and of appropriate size.

5.3.2 *Maps*

Maps are generally used in teaching of history and geography, and are easily available in the market. But if the teacher makes the map in the classroom it is all the more effective. Necessary signs and scale should be mentioned on the maps and the lines neatly drawn.

5.3.3 *Picture*

When real objects or models are not available, pictures can be used as visual aids. All types of knowledge cannot be imparted through pictures and their importance as a form of effective visual aids cannot be denied. Pictures should be clear, lucid and of appropriate size, coloured pictures attract more attention, especially of younger children. A picture should be so presented that it is visible to all pupils of the class, and should of course be suitable to the subject matter.

5.3.4 *Graphs*

The use of graphs is more frequently done in teaching of geography, history, mathematics and science. It is more useful in comparative study. For example, the wheat production of the last few years can be effectively shown with the help of graph.

5.3.5 *Globe*

The globe occupies an important place in teaching equipment, because it

is a true representation of the earth. It can impart comprehensive and effective knowledge about the different parts of the earth, the solar and lunar eclipses, the relationship between the earth and the sun, the area of the earth planetary movements, day, night, air, and the hemisphere.

A good globe is the true representation of the shape, form, structure and situation of the earth. It attracts students' attention towards certain special features such as:

(a) the real round shape of the earth;
(b) its rotation round its axis, and the daily and yearly movements which result in day, night and change in seasons;
(c) land is lesser in area than under water and the surface of earth is not even and level.
(d) Knowledge regarding the boundaries of islands, countries, provinces, cities, their comparative size and mutual distances, latitude, longitude and altitude, and the fact that local, national and international time is better understood from a globe.

5.3.6 *Diagrams*

Diagrams are figures expressed through lines to depict the complete shape and idea about a specific thing. The teacher uses graphs and diagrams to impart knowledge of science, geography, etc. and it does not involve much expense and time. The following main points should be taken into consideration regarding diagrams.

i) Graphs and diagrams be drawn in a manner to leave an effective impression on children.
ii) In order to explain flowers and plants in Botany and different parts of the human body in biology, diagrams are very useful.
iii) It will be more effective, if along with diagrams, the real object or its picture and film strip is shown.
iv) Graphs and diagrams should be simple and clear, so as to be understood. Their size must be reasonable, so that it is visible to all the students. Diagrams should be in accordance with the subject. The teacher may use different colours to express the meaning in a better way and to make the diagrams attractive.

Diagrams can be used effectively to explain various subject matters in visible form. Their success lies in the fact that students are able to understand the lines and the indicating words used in them and the message desired to be communicated. For example, internal construction of flower, eyes, ears and their working can be expressed through diagrams. In the same way they can also be used to depict the working

of computer, radio and television and other equipment, if students have their previous knowledge and follow the indicating lines and words. As far as the introduction of the subject matter is concerned diagrams are a great help. They are able to communicate more information at a glance. All this is possible, if the students have been explained beforehand how to read the diagrams.

5.4 BOARDS

Many kinds of boards are being used in the teaching learning process. These include:-

5.4.1 *Blackboard/ Chalk Board*

Chalk board is used for the following:

i) For presenting summary.
ii) For making any name or work clear and to accord it importance.
iii) For writing the sketch of a certain plan.
iv) For presenting charts, graphs, diagrams and examples.
v) For clarifying the sequence of any operation or thing.
vi) For giving certain instructions.
vii) For writing rules and definitions.
viii) For writing information, knowledge of data and tables.

Factors to be considered while using blackboard.

a) The teacher should collect all the necessary information before the commencement of class work. The requisites may be a duster or any thing else for wiping the board, apart from chalk, scale, forms, stencils and other materials.
b) Black board should be cleaned with duster.
c) Stat writing from top of the left corner. Only important points should be noted on the black board and it should not be used for comprehensive work.
d) The teacher should plan in advance what is to be written on the blackboard. No map or chart should be prepared on the blackboard before the class, nor no book should a book be constantly used.
e) Pointer should be frequently used.
f) The blackboard should be placed in such a way that all students can see it. There should be no shadows on it. It should not be placed very high above the sight level. The first row of students in the classroom should be at least eight feet away from it.
g) There should be clear and uniform writing on the blackboard. Whatever is written must be in order and sequence, so that students should also develop the habit of writing in an orderly

manner.

h) The size of words written on the blackboard should be conveniently visible to all students, and must be in straight lines.

i) the teacher should not cover the board while standing and writing. He should be at an angle of 45° to it.

j) After writing on the blackboard the teacher should stand at one side, supervise the class and attend to personal difficulties of students. He should do all these because every student could see and understand whatever is written on the blackboard.

k) Whatever the teacher writes on the blackboard he should go on speaking the same.

l) The teacher should also pay attention towards the students, while writing.

m) The blackboard must be renovated once in a year. It should be properly maintained.

n) It will be seen that the blackboard/chalk board has an important place among teaching equipments.

Blackboard/Chalkboard is one of the ancient means of imparting education. Teachers have started using chalkboards in place of blackboard in different methods of teaching. These boards can be green, yellow, or of any other colour instead of being black. Social studies and science teachers have now started feeling that chalkboards are very useful for them. They can used in different directions and for different purposes. They can be used to draw format of the subject matter, accounting for the work in progress, drawing figures, developing programmes and writing summaries. The blackboard is placed near the teacher and it can also play better role if properly used by him. It needs to be mentioned here that this quality is required in most of the teachers, whether he/she has been teaching social studies, or a language, mathematics, science or any other subject.

It is indeed a sorry business that some teachers are not able to write on the blackboard. It is a fact that the teaching of social studies requires different types of maps, pictures, diagrams and other materials which are available in the market, but it cannot be denied that the best maps, pictures, charts, graphs are those which are prepared in the presence of students. These type of teaching aids may contain only those matters which are necessary and subsidiary to the reference being taught. The map or chart, which is prepared in the presence of students is more effective and useful than those which are already prepared. This is why, preparing attractive maps, diagrams and charts on the chalk board or

blackboard by the teacher adds to his ability and efficiency and effectiveness. There should not be too excessive a collection of teaching aids. In order to reinforce different meanings of the subjects matter different colours should be used. We can use chalk of different colours on the blackboard for the purpose. In short there should be proper planning of blackboard work.

The use of blackboard/chalkboard can be very inspiring if properly used. Cleanliness, tidiness and speed can be developed by the effective use of black boards and chalk boards. A figure concerning a particular lesson drawn on the blackboard attracts the attention of the entire class. The teacher can lay stress on certain important aspects by writing on the blackboard and making maps, charts and diagram on it. The subjects to be displayed may be like this:

1. The life of a Pakistani village, which may have been displayed through photographs taken by students.
2. The life of hilly areas.
3. Sugar cane production of Pakistan.
4. The most important event of the week.
5. The covers of newly published books, which are supposed to be read by students.

5.4.2 *Bulletin Boards.*

Bulletin Boards are used for displaying the statements of learned persons, charts, graphs and other necessary pieces of information, so that students may be inspired and motivated for learning. The matter displayed on the bulletin board should be arranged in sequence and should be in accordance with the age and mental ability of the viewers. The board should be placed at a place where it can be easily seen and read by the students. These boards should be well-maintained and attractive. Students should also be provided the opportunity to display matters on them.

The matters displayed on the bulletin board must be attractive, meaningful, interesting and appropriate to the situation. They may include pictures, cartoons, advertisements, graphs, maps, charts, figures, news and writings from magazines and periodicals. The matters to be displayed must be selected by the committee.

Usefulness of bulletin boards.

1. Matters displayed through bulletin boards should not only be interesting but also intelligible to students.

2. As far as possible the matter should relate with the subject being taught to class.
3. The material should be changed with the change of educational objects and problems. It should provide desired direction for the unit being studied.
4. Headings, notes, covers, titles and colours, should be used in balanced artistic way so that the display is made meaningful and useful.
5. if students prepare certain material or bring after preparing it at home, they should be provided the opportunity to display it on the bulletin board.
6. Students should be provided with the opportunity to discuss the materials being displayed or that are displayable.

5.4.3 *Flannel Board*

Flannel boards should be sufficiently used in the teaching of social studies and science. Flannel boards are to a great extent similar to blackboards. They have a specific opportunity to change colour and speed and adjust to changes. This is why flannel boards are interesting.

i) Coloured lime series relating to a particular period or movement can be prepared and displayed in sequence in a useful way.
ii) While teaching a particular unit or regional expansion, a big map may be cut into useful pieces and shown on the flannel board after adding the extended regions.
iii) Pictures, photos, charts and graphs may be cut from newspapers and magazines and displayed on the flannel board, while teaching the economic social and political aspects of any country.
iv) Charts of cities, provinces or governments may be prepared and displayed on the flannel board and the constituents of these government may be explained.

The use of flannel board may prove to be useful for all types of students. It is specially useful for slow learners because it familiarizes them with ideas, places, persons and new descriptions.

5.5 NON-PROJECTED AIDS

5.5.1 *Models*

Model means the artificial form of an object similar and alike to the original. It does not mean that it should be a true imitation, but it should look like the original so that students may have an idea of the real object. While preparing a model, size, place, time price, etc., should be taken

into consideration. For example the Shahi Qila, an aeroplane or a railway engine cannot be brought into the classroom, but their small models can provide information about their construction.

Models are the reduced form of real objects to make their shape and form clear. Models are used in situations when the real object are very big and cannot be made available, and their pictures do not present true knowledge about them. For example, while discussing a dam, a good model of the dam may provide effective knowledge about it because a chart or picture cannot do full justice. Models of aeroplane, wild beasts, mountains, etc. can be used. They should be clear, attractive and representative of the real object.

According to Rashid M.(1993) models can be defined as recognizable three dimensional representation of real things. While teaching different subjects there are certain situations where a realistic model proves to be very effective. Such situations may be summarized as under:-

a) There are certain things which can neither be taught through two dimensional objects or charts or even the real object. For teaching about these objects models are the most suitable teaching aid. The structure of the eye and its working may be usefully studied through three dimensional models.

b) The use of models may prove to be very effective when bigger things are to be shown in smaller form or smaller things are to be shown in bigger form. For example, in order to study the size of the earth and its related knowledge the use of a globe is the most appropriate. In order to study mosquitos and other insects, their models of bigger size can be prepared and usefully employed for teaching.

5.5.2 *Real Objects*

The use of real objects as aids in teaching is the best way. For example, while teaching botany, the real plant can be used as teaching aid. It creates interest among students. As such, as far as possible the real object should be used as teaching aid.

It is always better to collect certain items, like bones, wings, leaves, flowers, metal coins, pieces of rock, stones tools and equipment, etc., and use them as teaching aids, while discussing these objects. Small bottles can be used for keeping different types of grain and pulses as samples. Flowers and leaves may be pressed between pieces of blotting

paper for 4-5 days and made flat and stored in the file. Beautiful collections and rare objects should be stored in glass jars and boxes and almirahs and displayed whenever required. These articles are very important for teaching social studies and sciences. Metal coins have got a special significance.

5.5.3 *Posters*

Posters have an important place among the equipment used in the educational process. Posters are the pictures of individuals, places, events and things but their expression is not direct and very clear. They have their own special indirect and symbolic value. While ordinary pictures furnish much information about a subject matter, posters are forceful expression of ideas. They are centered round a particular idea which is used to communicate a particular feeling. A poster is also used as a means to appeal to students in its own unique way. It leaves an impression on the reader. That is why it is widely used as a means of advertisement and publicity. Posters create a suitable atmosphere for change or to build up certain thinking, ideology and to inspire for doing a certain job. It can modify the behaviour of not only an individual, but also an entire group. It can be helpful in advancing plans for a movement and to divert an entire group towards a desired direction.

Posters are good means of communicating to the students in an attractive manner. Poster may concern any subject, Attractive posters use less number of words, and students receive information immediately through its lines and remarks. The idea behind the poster must be clear. The presented idea should be organized in a chain so that students can understand the theme. The selection, matching and contrast of colours should be balanced. The written matter on the poster should be bigger in size so that students can see it clearly. Posters can leave a permanent impression on students regarding personal hygiene, cleaning of teeth, hair, eyes and clothes, dangers of eating dirty eatables, importance of cleanliness and other good habits. Posters can be prepared with the help of magazines, cuttings and pictures. Posters can be prepared on paper, wood, cloth and plywood in different colours and sizes.

Posters can be obtained by teachers from external and internal sources. The teacher should himself try to collect, and also with the help of students, whatever useful is available from the community, society and from the advertisement and publicity world outside the school. The school should also try to get posters prepared by students in order to develop constructivity, ability among students as a part of internal source. The

following points should be taken in mind consideration for preparing storing and using posters.

1. The importance of poster as an education media must be recognized. Poster should be collected and prepared so that specific learning objectives can be attained.
2. Only those posters should be selected and used which can be easily understood by students of a class, and can modify their behaviour or bring it to a desired level.
3. While selecting the right posters for the class the teacher must take into consideration their potential for forceful expression of an idea. The idea should be clearly conveyed and appeal to growing minds.

Therefore, posters should be used effectively and forcefully in the teaching process. Their use can enable the teacher to achieve cherished goals.

Posters can be used to impart information regarding traffic rules, explain means of communication and fundamental rights, etc.

5.5.4 *Film Strip*

There are long strips on which many photographs, in a definite sequence, are set. The purpose of film strips can be fulfilled by showing slides in a continuous link. Whatever the number of pictures drawn on a film strip, these can be shown in a serial order with the help of the projector, so that in a well planned manner, information may be made available in a sequence, relating to concerned process or an event or the subject matter. Any teacher with a short training can make good use of film strips.

Film strips relating to teaching in social sciences/basic sciences can be obtained from libraries or concerned organizations. Professional centres also prepare such film strips.

5.6 STILL PROJECTED AIDS

5.6.1 *Projector*

Projector or Magic Lantern is considered to be one of the most ancient inventions in education aids. It is also known as diascope or slide projector. It works by enlarging the slide figure on a screen.

In a projector a slide is invertly inserted and by casting a strong light to pass through it, a magnified image of the picture on the slide is

thrown on the screen.

As an aid to teaching, it occupies a special place. With it can be shown spreading of diseases, the size/shape of small objects, ailments, caused by dirty water, the reproductive functioning of mosquitoes which are too subtle otherwise, but are magnified by the projector on the screen. The teacher becomes really efficient in making the teaching of social studies interesting.

The utility of projector in teaching.

1) Before showing the slide on the screen, if the teacher gives his pupils some information about the topic, it will have a greater impact on them.
2) The teacher should continue throwing hints, while the slide is being shown.
3) It is a convenient aid and so can be used in the class at any time and place.

5.6.2 *Slide Projector*

Simplest form of visual aid is a slide projector. It is also known as Strip Projector. It is a machine which projects slides on a screen.

Film Strip Projector is the most popular device used for projecting film strips and 2"x2" slides. It is essentially a simple mechanism and it consist of a lamp of 300 or 500 watt bulb, a reflector to conserve light, condensing lenses to concentrate all the light into a beam and a smooth channel for threading the film. On the base of the channel is a knob which is turned by hand to pull the film strip through the projector. The knob turns the sprocket wheel whose teeth fit into the sprocket holes on the film strips.

Every school must have one or two such projectors, and large schools must have many more. It is simple to use a slide is a small piece of film or other transparent material on which a single pictorial image or scene has been photographed. The slides should be in sequence, as per the topic discussed.

These slide projectors are sometimes not available or are defective and teachers do not feel like using them. Other forms are opaque projector and overhead projector.

5.6.3 *Epidiascope*

It is used to show opaque object on the screen. This is why, it is supposed to be better than a magic lantern. Any chart picture map, photograph and any printed matter can be projected without being detached from the book, there is no need for making slide for it. When opaque objects are projected, it is called Episcope. In case slide is projected it is called Diascope. This is the only means to project both transparent and opaque objects.

We can use bulbs between 100-500 Watts in Epidiascope. A fan is also used to protect the equipment from the heat generated by the bulb.

There must be proper darkness in the room while the Epidiascope is in operation so that the picture on the screen could be clearly visible. Notes and explanations by the teacher are also necessary together with projection. This equipment can be easily used for teaching any subject from any field.

5.6.4 *Overhead projector and Transparencies*

While using the projector or overhead projector the following precautions can be taken:

1. There should be no movement while the projector is in operation.
2. The electric bulb should not be touched with hand.
3. The equipment should not be used for a long duration.
4. The lens and the mirror of the equipment should be cleaned with cloth or brush.
5. The fluctuation in the voltage of electricity should be controlled through stabilizer.

Transparencies are used with overhead projectors. The overhead projector, besides projecting images and scripts previously written on transparent sheets, is also used as chalk board. A teacher can teach very well through an overhead projector. Its surface is covered with glass/plastic. The bulb is placed below this surface. Light from the bulb passing through the surface, reaches the mirror kept at 45 degrees angle and gets reflected to fall on the wall in front of the students. In this case, the teacher can face the students and write on the overhead projector surface and the written material gets projected on the wall. The height of the image can be adjusted. The teacher need not keep his back towards the students as happens in case of use of chalk board. Two or three pictures, graphs, images etc. can be superimposed. Generally, a roll of cellophane sheet is attached to one end of this projector, and images; graphs, etc, can

be drawn beforehand and used at a suitable time.

5.6.5 *Microfiche*

Microfiches are flat sheets of film measuring 105 mm x 148 mm cut from 105 mm roll film. Each fiche carries either 98 or 60 frames of images in rows and columns and is headed with an eye-legible little strip. Thus a book or other publication of 98 or fewer pages can be miniaturized on one microfiche at a reduction ratio or upto 1 = 24.

For further details about the above mentioned aids, including microfiche, please read the below referred material.

Das, R.C. (1993)	Educational Technology: A Basic Text, New Delhi, Sterling Publishing Private Limited. PP.39-59	5-1

5.7 FIELD TRIPS AND EXCURSIONS

Some experience outside the class should also be provided. It is an activity away from school and is carried out by one or more students.

Field trip provides first hand experience. You want to see a coal mine--you have to go there. That will be first hand experience and much more educative. A coal mine cannot be brought into a classroom.

Field trips not only broaden the minds of students but also change their attitudes towards a positive direction.

Field trips stand classified as short trips, formal trips, independent trips. It all depends upon the purpose of the trip.

Purpose of the trip must be clear to students. There are a number of purposes for which a field trip must be arranged:

1. To gain first hand information and contact.
2. To collect material needed for the course. Students of botany, biology undertake trips to collect specimens.
3. To become familiar with resources of the community.
4. To inspire good attitudes.

How to organize a trip? Any reasoned teacher can do it. Proper planning is a must to make it a grand success. Remember if a trip fails you will get all the discredit. Work out all details before going on a trip.

Libero, F. (1981) has given the following suggestions for organizing a trip:

1. Determine the specific aims of the trip.
2. Receive permission from the proper authorities to make the trip, and check all institutional regulations.
3. Make definite arrangements with regard to (i) date, (ii) time, (iii) number of students and (iv) objective of the trip.
4. If possible prepare guide sheets for students.
5. Check on location of rest rooms and eating facilities.
6. Check transport facilities.
7. In case you need to group the students, do the grouping in advance.
8. Make sure each student knows what he has to observe.
9. Keep to the time schedule. Be punctual.

After the trip is over, it can be followed up. You can discuss what you saw and heard. Let students ask you questions. Let you also ask them questions. You can prepare models based on your visit to the place.

In order to comprehend the full utility of field trips and excursions in teaching learning process, please read the below referred material.

Lalit Kishore (1989)	A Textbook of Audio-Visual Aids, Delhi, Doaba House Publishers, PP.57-61	5-2

5.8 EXHIBITIONS

Exhibition is that technique which presents for viewing, before students and visitors those articles, items and objects about which they are currently discussing. It places before them objects they have talked about in the past. Such items of information as charts, maps, pictures, diagrams, globes, paintings, specimen of embroidery, knitting, modelling, toymaking and other samples of pupils' work are prepared by students and displayed in exhibitions for students, their parents and members of the public. Exhibition is an excellent learning aid. The materials should be displayed in a certain section in a class room. Some schools have display cabinets in their corridors, some have exhibit rooms where handiwork of students and other material of current interest is displayed. Exhibits of pupils work in various fields like art, social studies, science and other related subjects are sources of great pride to the students and exhibition of such works excites, encourages and stimulates the interest of other pupils and their parents, and the general public for whom these things are displayed.

Exhibition has its specific educational importance in different fields. It enables the teachers to impart education in an interesting and effective manner. It serves as a impressive aid to teaching. It gives an opportunity to students and teachers to collect things and to display them properly for facilitating teaching-learning. It promotes a sense of achievement and dignity of labour and spirit of cooperation among the students. The importance of exhibitions can be seen in the following ways:

1. *Psychological value*
   Preparing specimens and exhibits channelises the creative energies of the children and provides them emotional and psychological satisfaction. Students get the opportunity to show their originality and talent which is sometimes rewarded, and thus they are motivated to produce, present and display the best of their creation. Exhibition helps children in satisfying their instincts of curiosity, acquisition and constructiveness.

2. *Educational value*
   Exhibition is considered to be a direct and potent means of educating pupils. It imparts knowledge in concrete form. An exhibition can be arranged on different subjects and topics corelated with the curricula. Through exhibitions pupils manage to acquire concrete and permanent knowledge about stamps, coins, flags, flowers, leaves, different types of trees, clay modelling, sculptures, paintings, embroidery, charts, models and maps, etc.

3. *Financial value*
   The articles and goods prepared by the students can also be put on sale. Thus exhibition can become a source of income to the school. Parents of children and other well-wishers can encourage the students by buying articles displayed in the exhibitions. This will help in giving students pride of achievement and a sense of financial independence.

4. *Publicity value*
   Exhibitions have great publicity value for schools. Distinguished educationists, high administrative authorities, philanthropists, parents and community members are invited to see the school exhibition. It brings the school and the community closer to each other. It helps the parents and public to know about the progress of the school and their children from time to time. The school earns appreciation from parents and the public and thus gets publicity.

5. *Useful for Public*

Exhibitions organized in schools act as an educative agency for the children and public. The Secondary Education Commission has rightly said "that exhibitions serve to educate the public at large and give them a realistic approach to scientific investigations and scientific discoveries" Thus these exhibitions have multiple values.

6. *Assessment value*

It is essential to evaluate and assess the work of the pupils from time to time to know about their level of achievement. The school authorities assess the quality of products prepared by students for the exhibition and assign marks. Best works and products are thus rewarded. This arouses competition among students to excel and surpass each other in learning. The specimens of various things collected, albums prepared, craft products made, pictures and charts made and paintings and other handiwork of students, and their application and assessment from time to time, promotes originality, creativity, interest, aptitude, skill and power of application of knowledge among them.

5.8.1 *Types of Exhibitions*

Exhibition has its own place in education and being a visual aid it is an effective means of instruction. Students learn from exhibitions both directly and indirectly. Education can be provided in its different fields by organizing different kinds of exhibitions at different occasions such as U.N.O. exhibitions, human rights exhibitions, book exhibitions, photographic exhibitions, school exhibitions, poster exhibitions, agricultural exhibitions, small-scale industry exhibitions, defence exhibition, and audio-visual exhibitions. Among these the most important exhibitions from educational point of view are the following.

1. *General or public exhibition*

The aim of this exhibition is to exhibit the progress of the country in different fields like agriculture, industry, defence, education, art and culture and other achievements of the various provinces. It gives an opportunity to visitors to come to know of the latest development in various fields and encourages them to do more and more research in these areas. Such exhibitions are arranged to apprise the public of activities and progress in every field. For example, National Industrial Exhibitions are organized every year successfully where industrial progress of Pakistan is demonstrated. A National Industrial Exhibition is also organized from time to time in Islamabad which provide us the information about

Pakistan's trade and industry.

2. *Mobile Exhibition*

A mobile exhibition, as the name suggests, is an exhibition on wheels. These exhibitions can be taken from one place to another and are very popular in progressive and advanced countries. They can be shown to the students again and again and help them in understanding the things and subject matter properly, clearly and vividly. They save time, energy and money of students and teachers as they are not very expensive. They are of great value and advantage for village children and adults who cannot come from far away places to see exhibitions in the cities. These exhibitions can also prove to be a great asset in solving current problems, because, through them people can be made to know, about the importance of growing more food, for example about population control, and solve various other problems like housing, drinking water, electricity, health services, education services and transport arising out of fast increasing population. In these exhibitions, play cards, bearing slogans like "Grow more food", "Shed hatred not blood", "small family leads to happy life" and "bride is dowry" etc. can be displayed to create profound effects on the minds of the people about current social and economic problems of the nation. These exhibitions also promote communal harmony, sense of love, affection and brotherhood and co-existence. Mobile exhibitions can be used to remind the people of the deeds and achievements of great men who worked for the achievement of Pakistan. They can instil a sense of patriotism in the people, apart from giving them an idea of the progress of agriculture, industry, military preparedness, literacy, development of villages, improvement of standards of living of the people, etc. In short, we can say that organization of such exhibitions is very helpful to the country, as, after seeing them, people are motivated to work harder and to take the country higher and higher towards economic and social development.

3. *School Exhibition*

School exhibitions are organized by schools from time to time. It gives an opportunity to the students to exhibit their interest, aptitude and some sense of creativity. Every child has skill, aptitude and interest in a particular field. Exhibition gives proper environment and opportunity to children to express their talents and to show their skills. This is the reason students from well

known schools are intelligent in specific fields. School exhibitions provide latest development of knowledge to the students regarding different subjects. They sharpen their intellect when they show special interest in collecting books, maps, models and charts etc. Thus school exhibitions help in providing informal and permanent instruction to the students.

4. *Audio Visual Exhibition*

Audio visual exhibition has a significant place in the educational process. In order to make educational programme interesting, effective, dynamic and meaningful, there is a strong need for organizing audio-visual exhibitions in every school every year. Use of audio-visual aids makes lessons more meaningful, interesting, impressive and useful to the students. Those teachers who make use of audio-visual aids are both popular and successful. Such exhibitions can be organized with teacher-student cooperation and students' opinion can be invited on how to organize such exhibitions, and also they can be asked to collect and prepare a list of all possible audio-visual aids that can possibly be used in the teaching of various subjects. In this regard creative children can play an important role and suggestions can be invited from them. While organizing audio-visual exhibition the teachers and students should keep in mind the different types of audio-visual aids relevant to different subjects. Audio-visual aids also act as a guide to teachers. For example for better and effective teaching of history such audio-visual aids as time-line charts, pictures and models can be useful.

For teaching science, use of models of scientific apparatus and instruments is effective. For example, the teacher can demonstrate to the students the models of instruments used for generating electricity. In agriculture the teacher can use specimen of seeds, charts and pictures of different types of crops, means of irrigation and agricultural equipment like tractors, etc, to provide relevant knowledge to the students. Similarly use of audio-visual aids in other subjects like economics, geography, civics, mathematics, physics, chemistry, biology, etc. is essential to create interest in students and to make teaching-learning more meaningful, permanent and impressive.

In basic schools, education is craft centred which emphasizes the use of audio-visual aids. Audio-visual exhibition

should have articles of different crafts such as basket making, toy making, clay modelling, soap making and other handicrafts, computer hardware and software, television, radio, tape-recorder, teaching machine, epidiascope, diascope, film strips, picture charts, maps and models, etc. School exhibitions and audio-visual exhibitions reflect the different activities and educational standards of pupils and teachers. These exhibitions are also helpful in making evaluation of school progress and educational achievements of students and teachers.

For further details, please read the below mentioned material.

Samanta, R.K. (1991)	Manual on Instructional Aids for Teaching Excellence, New Delhi, Mittal Publications, PP.20-24	5-3

5.9 MUSEUMS

To make the teaching-learning process meaningful, absorbing and interesting, it is essential that students should get direct experiences from education in order that their interest is sustained and they cooperate in learning. Presently, in order to facilitate teaching-learning, use of audio visual aids is becoming more and more important. Every progressive school should have its own museum i.e. a place where it preserves historical and cultural objects. Museum is helpful in imparting wholesome education at all levels. It is a sort of agency of education. The word museum is derived from a Greek word which means temple of muses i.e. a place of study. The Secondary Education Commission has stressed the need for setting up museums in schools for making the teaching-learning process more interesting. According to the Commission, "Museums play a great role in the education of school children as they bring home to them more vividly and clearly than any prosaic lecture, the discoveries of the past and the various developments that have taken place in many fields of science and technology". Museum is a place where different types of articles and collections relating to past are stored and exhibited in a systematic order. It helps in arousing social, political, economic and cultural consciousness among children.

Museum has its specific educational importance in different fields. It enables the teachers to impart education in an attractive and impressive way. It serves as an effective aid to teaching. It gives an opportunity to students and teachers to collect and display things properly to supplement teaching-learning. It promotes a sense of dignity of labour and cooperation among students. It increases their general knowledge. It creates and fosters among them the spirit of

enquiry into the past and to link the past with the present. The utility of museums can be appreciated from the following points of view:

1. *Educational or Academic Values*
Museum are important means to provide direct and correct knowledge to children. They help in supplying background of information regarding various fields of learning. Various subjects and topics in the curriculum can be corelated with museums. It is a general feeling that children learn better through demonstration and displays. Museums thus motivate pupils to learning. In museums display of paintings, sculptures, models and replicas of various old objects and scientific apparatus helps students in acquiring concrete and permanent knowledge. For example, through museums ancient and modern models and collections of motor cars, railway engine and coaches, war material like guns, tanks and fighter planes, commercial aeroplane etc, the learning curiosity of children can be greatly aroused. It is observed that processes of development of various scientific discoveries can be better understood and appreciated through demonstration. In brief, it has come to be generally accepted that museums serve as an effective and impressive teaching aid in the formative age.

2. *Financial Values*
Museum has great financial value to the students. Educationists gave the idea of basic education which emphasizes handicrafts for children such as soap making, match box making, candle making, toy making, clay modelling, painting, decoration pieces etc, so that they can earn in future by making and selling these articles. The Secondary Education Commission also lays stress on the concept of earning while learning. These articles can be made by children and displayed in museums and can be put on sale which can fetch income for schools and children, making them self-reliant. This will help in creating self confidence in children.

3. *Geographical value*
Museum has geographical value too. The specimens and samples of soils, seeds, rocks, minerals, maps, models are very useful for the students to know about in regard to geography and geology. These things also create and arouse interest among students to learn about the past.

4. *Psychological value*
Museum has great psychological value. It satisfies the instinct of constructiveness, curiosity and acquisitiveness of the child. Sometimes the best items are rewarded and the pupils are motivated to produce and create

good things. This gives him emotional satisfaction also.

5. *Publicity value*
Museums have publicity value for schools. Distinguished educationists, higher authorities, parents and community members are invited to see the school museum. It brings the school and community closer to each other. If can help the parents and public to know about the progress of the school.

6. *Social value*
Museum is helpful in giving knowledge about the social activities, social sanctions, social structure, social values, interests and aptitudes of the society.

7. *Cultural value*
Museum has cultural value too. Everything kept in museum reflects the culture of the society. Dresses, models, coins, specimens of old articles preserved in museum tell us about the country's culture.

8. *Historical value*
Through museum, history will come to life when the children see the relics of the past. Collections of articles, pictures of old monuments, ruins, paintings, ornaments, dresses, weapons and sculptures, etc, will impress upon the students that history deals with real people, places and things.

9. *Political value*
Display of charts, models and pictures of national and international leaders like Quaid-e-Azam, Allama Iqbal, Sir Syed Ahmad Khan, Abraham Lincoln, Lenin, Miss Fatima Jinnah, Liaquat Ali Khan, and scores of other leaders will help in development the sense of patriotism and nationalism among pupils. This will enable the students to know how these great men struggled for achieving freedom of their countries.

10. *Scientific value*
Display of pictures, charts and models of great scientists and their inventions and discoveries as of Newton, Marconi, the Wright Brothers, Madam Curie, Bu Ali Seena, Abu Rahan Al-Berooni and many others, motivate students to discover new things and thus museum has great scientific value for them.

In modern times, education has become child centred. Its aim is to develop the three H's i.e. Head, Heart and Hand of the student unlike the education of 3 R's i.e. Reading Writing and Arithmetic as in the past. For harmonious development of the child, it has become essential to give knowledge through direct objects so that it makes a permanent place in the minds of the children and creates motivation for learning. To fulfill this aim, every institution should arrange a school or audio visual museum on its premises. A museum is useful from the following angles:

i) A school museum provides new and comparative knowledge to students and teachers to make teaching learning more effective, purposeful and meaningful.

ii) The museum provides more and more learning experiences and widens the horizon of knowledge of the students.

iii) It helps in developing cultural, economic, political, geographical, historical and educational awareness and consciousness among students and learners.

iv) It encourages students to participate actively in the process of education and teaching-learning.

v) It provides opportunities to the students to give shape and form to their imagination. It develops confidence among them and helps them in all-round development of their personalities.

vi) When children look at the objects in the museum prepared and constructed by them, they feel delighted, proud and it develops originality and creativity in them.

vii) By seeing new things in a school museum students will think about them and discuss them. A museum helps in developing the power of thinking and reasoning in students and develops their knowledge, interest, motivation and creative ability. It is in an important link in the educational process which opens the door to vast treasures store of knowledge.

Teachers, students, principal and school management should take active part in the organization of the school museum. Its organization needs careful planning and cooperation from all concerned.

In order to comprehend further the role of museum in education, please read the below referred material.

Mangal, S.K. and Mangal Uma (1991)	Audio-Visual Education, New Delhi, Arya Book Depot. PP.186-197.	5-4

5.10 RADIO

The importance of radio in these days of education, technology can hardly be over-stressed. It is a powerful audio-aid. Pupils of remote places have been benefited by radio lessons. Lectures by educationists are broadcast for imparting useful information. The headmaster and concerned teachers must have before-hand information about such lesson programmes. There are two types of radio broadcasts:-

i) *Ordinary Broadcast*
Knowledge of general incidents and situations is given through ordinary broadcasts.

ii) *Educational Broadcast*
Such broadcasts are especially designed for pupils in the form of radio-lessons to achieve teaching objectives.

5.10.1 *Use of Radio in Teaching*

a) First of all, the teacher must gather information about radio lessons and study the same. This type of study includes time table and list of programmes.

b) He should carefully plan on the basis of information collected earlier and by establishing its relevance for the subject to be taught.

c) He should motivate the pupils mentally so that they learn to listen attentively.

d) Physical conditions i.e. seating arrangement, light and air, silence, etc., should be well-organized.

e) Follow-up should also be done after listening to the radio. Discussion should be held on the radio-lesson. Pupils should get opportunity to remove their doubts. They should take notes while listening to the broadcast lesson and thereafter they should get time to complete their notes. They should be asked not to put questions during the broadcast lesson. They should be instructed to note down all the questions they want to ask when the broadcast is over.

5.10.2 *Advantages of Radio*

i) Radio gives opportunity for listening to lectures of famous educationists and thinkers which is otherwise not possible for each and every pupil and teacher.

ii) Radio broadcast helps the teacher in achievement of teaching objectives.

iii) They also provide entertainment in addition to serious learning.
iv) Radio is very helpful for remote areas where teaching facilities are not adequately available.
v) It is less costly and even common people can make use of it.
vi) The teacher also learns much about latest concepts and principles.
vii) In view of the increasing population, radio broadcasts have acquired much importance.

5.10.3 *Limitations of Radio Lesson:-*

a) Sometimes the pupils' carelessness neutralizes the benefits.
b) Pupils remain passive during such radio lessons.
c) Follow-up programme is sometimes not honestly done.
d) Sometimes pupils and teachers fail to get prior information about radio broadcasts and they, thus, remain deprived of their benefits.

Das, R.C. provides comprehensive details about the role of radio in education. Please read his book indicated below.

Das, R.C. (1993)	Educational Technology: A Basic Text, New Delhi, Sterling Publishing Private Limited. PP.78-93.	5-5

5.11 EDUCATIONAL TELEVISION

Through a television programme the audience not only hears but also sees an event taking place. Television is both audio and visual. It is a great improvement upon radio broadcast. It is fast becoming an integral part of school education. Invention of television has brought a great revolution in the world of education. To day it is considered to be really an important means for effective education. It is a powerful medium of communication through auditory as well as visual channels. It helps the students to listen and directly see the lesson on the television screen ensuring teaching learning to be durable and everlasting. Tele means distance and vision means to see. This appliance makes it possible to transmit instantly every picture, sight, written or spoken word, sound and action of events as they occur and one can see all these from a along distance.

Television was invented by J.L.Baird. Its popularity is fast increasing. It has been greatly used in developed and industrialized countries of the world for education and other purposes. It holds fascinating opportunities for the world of education. In this era of constant change, it has opened new vistas for instructional media to meet the problems of shortage of school facilities for ever growing school population. It is of immense help in the field of education to poor

countries of the world where school going population is quite big and there is acute shortage of qualified teachers, well equipped laboratories and other necessary infrastructure for the growth of education. It can reduce the mounting cost of education in underdeveloped countries.

Utility and importance of television can be seen in various ways. One of its aims is to provide recreation and amusement to the masses. It is a mass media through which number of programmes relating to education, entertainment, culture and sports, etc. are telecast for billions of people all over the world. Through various programmes, television helps us in achieving such aims and objectives as social, economic and political justice, liberty of thought, expression, belief, faith and worship. It also helps in promoting a sense of fraternity, dignity of the individual, equality of a status and of opportunity and cultural unity of a nation. It helps us in knowing what is happening in which part of the world in a shortest possible time.

As an instructional tool also television holds unlimited opportunities and it is being used in a variety of ways for direct teaching, for supplementing class room teaching, for enriching schools and colleges, for eradicating illiteracy, for educating adults and for teacher training. At the school level this powerful medium is being used by different countries in different ways in solving their variety of immediate problems. Even highly developed countries of the world like France, U.K, USA and Japan have made great use of this medium to meet lack of school facilities, to modernise teaching techniques, to assign to teachers new functions and to stimulate active participation of students in the teaching learning process.

5.11.1 *Role of television in education*

Use of television has fascinating and tremendous opportunities for the world of education. Television as an instructional tool, is being used in a variety of ways: for direct teaching, for supplementary or enriching the work of schools and colleges, for eradicating illiteracy, for adult education and teacher training etc. At school level, different countries are using this powerful medium in different ways in solving their immediate problems. For instance Italy made use of it to meet lack of middle school facilities in rural areas by imparting complete course of instruction normally given in middle schools. In France television has been greatly utilized as part of a vast effort to modernize teaching techniques.

a) Television teaching provides greater equality of opportunities of receiving education for all pupils. We know education is the most important single factor in achieving rapid economic development and for creating a democratic social order. Television acts as a

mass medium of education and is really a very powerful tool to provide qualitative instruction and for quantitative expansion of education at all levels.

b) Television teaching creates initiative and inquisitiveness in students. Tele-lessons open a lot of avenues for the students for new creative activities by encouraging model making, experimenting with home made apparatus and becoming keen observers.

c) The impact of television on teachers is in no way less. It is evident that tele-lessons put greater demands upon teacher's time because they have to make intensive preparations for these lessons. Naturally this pressure for better preparation will result in better classroom teaching. Thus television is of great help inprofessional in developing a teacher's capacities.

d) Through television, the whole teaching process is undergoing a change for the better. Teachers are giving more thought to what topics need to be included in the syllabus. Television programmes prove helpful in upgrading the curriculum and enriching the educational programme more easily and economically. Students are learning better with television.

e) Television can display the world of reality and students can see a host of other things in the classroom through its screen which serves to widen the horizons of children, something that is not within the reach of a common student.

f) Television as a medium of education has helped in making school a centre for community welfare and education.

g) Television can help the teachers and the students in the realization of various teaching and learning objectives. Its use has improved attendance in high schools. In two shift schools, in view of less time at the disposal of teachers, television helps in completing the prescribed course in time. As an educational device it has helped in overcoming problems of shortage of good teachers, classrooms, audio and visual aids and other resources.

h) Television can serve as a vehicle of excellence to the students. They can view and hear about the works and thoughts of eminent educationists, renowned teachers and scholars, creative scientists and excellent musicians and artists. Various discussions, which are shown on television, are based on the latest researches and innovations, and by listening to these and by seeing these experts on the television screen students and teachers get due inspiration and motivation and enrich their knowledge. By viewing the visit to Pakistan of foreign Presidents and other dignitaries and foreign

visits of our national leaders and their welcome in foreign countries, children feel excited and it gives them the feeling as if they are also visiting foreign countries with their national leaders.

i) Television has played perhaps the greatest role in promoting international understanding. Recently all over the world a great emphasis has been laid on education in international understanding.

j) The usefulness of television for social education cannot be under estimated. Various programmes covering topics like traffic and road sense, community health, adulteration in food, child marriage, good manners, encroachment of public property relating to social education can be put out for the welfare of the people. Experience shows that television teaching has greatly spread social education in underdeveloped countries having high illiteracy rates.

k) Television is a very useful device and not a means of luxury. Things that are listened are not as effective as the things seen by one's own eyes. The younger generation feels more impressed by seeing a person on T.V. The main reason for the popularity of dramas and films is due to their hold on growing minds.

l) With the help of television celebration of various national days, for example Independence Day, Birthday of Quaid-e-Azam Pakistan Day, Army parade, Eids, Muharram etc, can be shown. Thus television helps in inculcating in students feelings of nationalism, patriotism and brotherhood.

m) With the help of television, the students can be made aware of the progress and events of the nation and of foreign countries. While in school they can see the events taking place in any part of the world. They can also know about the educational system and structure of different countries.

n) Television's contribution in the field of sports too is appreciable. Telecast of various games and matches of cricket, hockey, badminton, table tennis, etc, which are played the world over, created interest among children for games and sports. It also motivates children to participate in sporting activities.

o) Television teaching can contribute a great deal in promoting general education like art, humanities, science, music, agriculture, languages, health education, yoga, home administration, etc. These programmes help children in learning about the modern techniques used in above mentioned disciplines. These programmes will develop basic skills and stimulate the students' interest in a variety of subjects. Such programmes can also introduce the students to Pakistan crafts and rich cultural background, the meaning of citizenship and the interpretation of current affairs.

Consequently, we can say that television holds vast opportunities and great potentialities for the world of education.

5.11.2 *Limitations of Television*

There are certain lessons and topics which involve too much of practical work. Such lessons involving numericals and too many calculations should not be chosen for television.

Experts teaching on television cannot repeat the lessons. If students do not understand certain portions of a lesson or in case of other difficulty, students cannot talk to the television teacher and thus he fails to help the pupils.

It is not possible to use television in the absence of electricity. There is acute shortage of electricity particularly in Pakistani rural areas. Electricity failure is a common problem and frequent breakdown of electricity limits the use of this medium.

On the other hand, by direct teaching through lecture and other methods in the classroom, the interaction between students and teachers is possible. The students can ask questions and ask the teacher to repeat what they do not follow. Also the teachers can evaluate the students in respect of their knowledge and can know how far the students have grasped the lesson by asking them questions relating to the lesson.

Due to shortage of funds and meager public expenditure on education, a large majority of schools, particularly in rural areas, cannot afford television.

Television requires careful handling. If it goes out of order, it can be repaired only by expert mechanics.

For further details, please read the below referred material.

Das, R.C. (1993)	Educational Technology: A Basic Text, New Delhi, Sterling Publishing Private Ltd., PP.94-117	5-6

5.12 RECORD PLAYERS

The oldest form of recorder-player was the hand-operated gramophones. It played discs. The electric version was used to play discs which taught correct pronouciation of languages called linguaphone records. English teachers of good schools still use these records in their day to day teaching. At times, records are also available about sound effects.

Teachers can suitably use these records in various teaching learning situations. Records of speeches of leaders can be well integrated with classroom teaching activities. However, for more details, please read the below referred material.

Lalit Kishore (1989)	A Textbook of Audio-Visual Aids, Delhi, Doaba House Publishers, PP.70-72.	5-7

5.13 TAPE RECORDER

This equipment records sound. It has got three parts:-

a) Implement for sound input called microphone.
b) Amplifier.
c) Reproducer.

There are two main functions of this equipment. Recording and reproducing. An ordinary person can operate it. There are clear-cut instructions on every button of all the tape recorders regarding its operation. For example, the word 'Play' is written on the button meant for starting the operation of the tape recorder. In the same way 'stop' is written on the button required for halting the recorder.

Tape recorder should be placed on smooth surface, Matters recorded in the tape can be erased and new matters recorded.

Tape recorder is useful for imparting training of music, language, drama, etc. It can also be used to correct defects of speech and pronunciation. It is also useful in micro-teaching, reinforcement of general teaching and its evaluation, in preparing commentary with film slides. Lectures for educational importance and other programmes can also be recorded and reproduced at any time.

In order to have full details about the use of tape recorder, please read the below given material.

Romiszowski, A.J. (1974)	The Selection and Use of Instructional Media, London, Kogan Page Limited, PP.165-169.	5-8

5.14 VIDEO CASSETTE RECORDER

Audio-video technology has emerged as an important tool in imparting knowledge for a distance learner. Unlike traditional student, the distance learner need not travel to school or college. The audio-video cassettes can be played and

replayed at his own will. He can stop a particular tape at a point where more details are necessary and can play on slow motion to understand a difficult point. He need not get up early in the morning or late in the night for radio and TV broadcasts. Audio-video cassettes produced for each course by AIOU are kept at all Study Centres and Regional Centres distributed all over the country.

The potential advantage of video cassette lies in the fact that control of the equipment and the learning process is placed in the hands of the learner through control over the mechanics of the machine, i.e., stopping, starting, timing, reviewing and previewing. Consequently the ability to order the sequence of events controls the rate of learning, and facilities practice sequences.

Potential exists for providing the basis for learning a wide range of motor, intellectual and cognitive and interpersonal skills, as well as affective aspects. These are important aspects which printed materials cannot deal with adequately.

In some countries as a way of regionalizing a centrally produced programme, video cassette programmes are being built round the study centre concept, a location where several video machines are available to which students bring their study notes. The students run the programmes as individuals. Sometimes study centre provides for groups sessions during which video cassettes are played.

In other countries some institutions assume that students can gain access to such equipment and make programmes which will be used on an individual basis as either supplmentary learning material of integral to the teaching programme.

The problems associated with video cassettes are of two kinds:

i) The cost of producing video cassette programmes is usually lower than that required for broadcast television programmes. Unfortunately, however, equipment costs cannot always be kept down by using lower quality equipment. Cheaper equipment formats do not enable technical material such as animal or plant-tissue to be represented adequately or tapes to be reproduced in quantity without loss of fidelity.

ii) Video production for educational purposes calls for new techniques different from the entertainment modes. Producers, directors, scriptwriters need to be knowledgeable about teaching and learning. Many of the old techniques of film and television will no longer be of use.

For further details, please read the material as indicated below.

Norman, J.Atkinson & John, N. Atkinson (1975)	Modern Teaching Aids, London, Macdonald and Evans Ltd. PP.217-218.	5-9

5.15 VIDEO DISCS

Video discs are capable of sorting upto 55,500 individually numbered pictures. This gives about 37 minutes of continuous playing. However, the advantage of the disc lies in its capacity to permit immediate access to any one of the 55,500 individual pictures and its ability to hold that picture on the screen.

The disadvantages of video discs are: (i) the high cost of producing the master laser disc (this is in addition to producing a video tape master): (ii) the high cost of players; and (iii) the fact that it is a 'play only' device that cannot record.

While a great deal of research and money have gone into video discs in equipment and software development it is fair to say that as yet it is in its infancy.

Lalit Kishore has given a good idea about video disc in the below referred book. Please read it for further comprehension.

Lalit Kishore (1989)	A Textbook of Audio-Visual Aids, Delhi, Doaba House Publishers, PP.101-103.	5-10

5.16 LANGUAGE LABORATORY

The purpose of the language laboratory is to develop listening and speaking skills in foreign languages. The system employs individual study carrels (booths) and the use of audio tape equipment and headphones in combination with other materials. For reasons of convenience, these facilities are housed in one place, as opposed to being portable or mobile. The maintenance of the complicated electronic components is a highly skilled job, requiring an appropriately skilled staff.

For further details, please read the material as indicated below.

Norman, J.Atkinson & John, N. Atkinson (1975)	Modern Teaching Aids, London, Macdonald and Evans Ltd. PP.245-249.	5-11

5.17 ACTIVITIES

1. Please prepare a chart of graphical aids alongwith their potential advantages in education.

2. Write down the special care to be taken while using blackboard/chalkboard and other types of boards.

_____

_____

_____

_____

3. Please list below the advantages and disadvantages of TV and Radio particularly in teacher training.

_____

_____

_____

_____

4. Please visit any model study centre of AIOU or school and prepare a list of projected and non-projected aids available their.

5. Discuss the benefits of field trips, museums and exhibitions with any of the educationists of your area and prepare a report of the outcome of your discussion.

6. Please use any language laboratory and give your impression about its role in language teaching.

5.18 EXERCISE

Hopefully, you have studied the unit, now please answer the following questions.

Q.No.1 Explain the significance of instructional media in education.

Q.No.2 Critically examine the role of graphic aids like maps, pictures, charts, graphs, globes and diagrams in the teaching learning process.

Q.No.3 Discuss the advantages and disadvantages of chalkboard and blackboard in education.

Q.No.4 Critically examine the utility of models, posters, film strips, projector, slide projector, epidiascope, overhead projector and transparencies in education.

Q.No.5 "Museums are primary source of information". Discuss the statement with reference to the role of museums in education.

Q.No.6 How can students be benefitted from exhibitions? Explain.

Q.No.7 What impact does the slide programme have on teaching learning process? Discuss.

Q.No.8 Discuss the role of tape recorder and record player in education.

Q.No.9 Critically examine the significance of V.C.R. and video disc.

Q.No.10 Write a short note on.

1. Micro-films.	2. Microfiche.	3.Transparencies.
4. Models.	5.Charts.	6. Excursions.
7. Overhead projector.		8. Video Disc.

Q.No.11 Discuss the significance of education television.

Q.No.12 Explain the importance of educational radio and television. Which medium is more effective in Pakistan and why?

Q.No.13 Is it possible to use video in Pakistani schools? Discuss.

Q.No.14 Critically examine the role of educational broadcasting in the teaching learning process.

5.19 BIBLIOGRAPHY

1. Chase, Richard, A (1975) "Museum as Learning Environment", In Museum News, Septt. Oct. 1995.

2. Das, R.C. (1993) Educational Technology; A Basic Text, New Delhi, Sterling Publishing Private Limited.

3. Derick Unwin & Ray McAleese (1988) The Encyclopedia of Educational Media Communication and Technology, 2nd ed. Greenwood Press.

4. K.Sampath, A. Panneerselvam, S.Santhanam (1984) Introduction to Educational Technology, New Delhi, Sterling Publishers Private Limited.

5. Lalit Kishore (1989) A Textbook of Audio-Visual Aids, Delhi, Doaba House Publishers.

6. Libero, F (1991) A discipline analysis of audio-visual media utilization by the Faculty of School of Education at Indiana University, Ph.D. Dissertation Indiana University.

7. Norman, J.Atkinson & John, N. Atkinson (1975) Modern Teaching Aids, London, Macdonald and Evans Ltd.

8. Ralph Cable(1975) Audio-Visual Handbook, London, Macdonald & Evans Ltd.

9. Rashid, M. (1993) Educational Technology, Dode-740, Islamabad, AIOU.

10. Romiszowski, A.J. (1974) The Selection and Use of Instructional Media, London, Kogan Page Limited,

11. Samanta, R.K. (1991) Manual on Instructional Aids for Teaching Excellence, New Delhi, Mittal Publications.

Unit No.6

COMMUNICATION

By

Dr. Muhammad Rashid

6.1 INTRODUCTION

The oldest meaning of the word, "communication" in English can be summarized as the passing of ideas, information, and attitudes from one person to another. But later, communication came also to mean a line or channel from place to place. As used in this unit, communication refers to the ways in which we get in touch with other people-how we show each other our feelings, tell each other our thoughts; ask questions; ask for help; pass on facts; argue; persuade others to do what we want them to do; explain give orders. We all spend a very large part of our waking lives in communicating. Effective communication is also useful in our private lives too. The more articulate we are as communicators, the more useful we can be as human beings. However, use of the word is concerned with the methods we employ in communicating with each other and how we can improve our use of these methods.

There are many ways of communicating. If we look at history, some sort of human communication must have been going on all the time ever since the first recognisable human creatures developed on the earth, but billions of years passed before man invented speed. According to Peter Little (1973-P.5):

> "Communication by speed has probably existed for something approaching 500,000 years. Communication by writing is a more recent invention; it has been in use for only about 5,000 years. In view of the long time human beings have been communicating with each other it seems add that it is only in the second half of the twentieth century that we have started to look in and begun to think about how we can do it effectively."

Likewise, Colin Mares (1966) gives the definition of communication as:

> "Communication refers to the processes by which
> human beings send and receive messages in such a way
> that a close approximation is achieved between
> the message as sent and the message as understood by
> the received."

However, the nature of communication, its various types, communicational media and particularly the role of educational technology in communication are very important aspects of this subject. In this unit, effort has been made to highlight all the items.

6.2 OBJECTIVES

After reading the unit, the student will be able to;

1. explain the nature of communication;
2. discuss the problems of communication;
3. state communication theories and models;
4. describe communication and education; and
5. identify the selection of media for effective learning.

6.3 NATURE OF COMMUNICATION

The word communication means 'sharing' or 'common'. Wilbur Schramm (1960) treats "communication as the exchange of knowledge, skills and attitudes among persons or among social groupings". Peter Little (1973, P.5) defines communication as "the process of relaying or transmitting a sign or symbol-verbal, written or pictorial--from a specific source to a specific audience or receiver by means of any one or all of several media that act as channel". According to Colin Mares (1966, P.9), "a convenient way to describe an act of communication is to answer the following questions:

Who,
Says what,
In which channel,
To whom,
With what effect?"

John Adair (1973, P.13) describes it "as a process by which two or more people exchange ideas, facts, feelings or impressions in ways that each gains a common understanding of the meaning, intent, and use of message". John Parry (1970, P.9) defines communication as all of the procedures by which our mind can affect another, whereas it is defined by Raymond Williams (1966, P.3) as "a process by which an individual, the communicator transmits usually verbal symbols to modify the behaviour of other individuals".

In the simplest sense, communication means that a sender and a receiver are tuned together for a message. Communication is the process of transmitting meanings between individuals. This process is of great importance to human beings because the ability to communicate with others enhances the chances of

success of an individual. In fact, a person cannot live without communicating with others. It is through communication that a person can define his own position in relation to other people and is able to adapt successfully to his environment.

Until and unless a message is encoded by the sender and relayed by the use of the signals, and subsequently decoded at the destination, no communication can be expected to have been taken place. It signifies, thus, the following points.

1. There has to be a source.
2. Source has a message to convey.
3. The source has to encode the message.
4. Some signal or channel(s) is to be employed.
5. There has to be a receiver.
6. Receiver has to decode the message.
7. Receiver has to give some response.

Keeping the significance of communication in teaching-learning process in view, efforts have been made in this unit to highlight the nature, scope and role of communication in education.

For further details, please read the below referred material.

Harris, N.D.C. (1979)	Preparing Educational Material, London, Croom Hlem, PP.14-22	7-1

6.4 ELEMENTS OF COMMUNICATION

Schramm (1960) observes that any process of communication always requires at least three elements: **the source, the message,** and the **receiver.** Communication takes place only if there are at least two persons, one who wants to communicate and the other with whom he wants to communicate. The communicating person will act as the source and the listener will be the addressed person. In addition to these two, there must be some message which the source wants to communicate. These three main elements are essential for communication to take place. At the same time, the communicator will have to employ certain channel(s) to convey his message. Therefore, the channel can also be treated as one of the elements. According to David K. Berlo (1960, P.18), there is need for a **source,** a **transmitter,** a **signal,** a **receiver** and a **destination.** An effective communication process in extension education should have six elements, i.e. **source, message, channel, treatment** of the message, **audience,** and the audience's response.

Only four main elements will be discussed here, because treatment of the message is an action to be performed by the source and will be covered while discussing the 'communicator'. Similarly the audience's response will be discussed under 'feedback'. These elements, along with important characteristics, are discussed below:

6.4.1 *Communicator*

Communicator acts as a source or originator of the message(s). This is the person who starts the process of communication. The task of a communicator is in two parts, i.e. selection of the message and its treatment. A communicator is like a soldier. A soldier can be successful if he has sufficient ammunition and latest weapons. Same is the case with a communicator. His ammunition is his knowledge and communication channels are his weapons. To be successful, he should be up-to-date in his knowledge, have suitable channels at his command and possess adequate skill in handling various channels or teaching methods. It is also recognised that transfer of ideas occurs most frequently between a source and a receiver who are alike and similar. This aspect plays an important role in communication because most individuals enjoy the comfort of interaction with others who are similar to them in certain attributes, such as beliefs, values, education and social status. The following are the qualities which can increase the effectiveness of the communicator:

- Knowledge Level: He must know his message, its objectives, and his audience. Only then will it be possible for him to present his message in a way that the audience understands, accepts and adopts it. It is a fact that one cannot communicate what one does not know. Therefore, knowledge of the communication process and subject matter are essential for the communicator to be successful in his efforts.
- Faith of the receiver: Acceptance of a message largely depends upon the credibility which the audience accords to the source. Credibility of the source plays a significant role in the acceptance of a message by the receivers. The more the source is perceived as trustworthy and competent by the receiver, the more will be the acceptance of the message.
- Interest: The success of the communicator also depends upon the intensity of the efforts he is going to put in communicating his message. He will make a greater effort, if he has interest in his audience and their welfare. At the same time he will continue or make efforts to improve his performance if he has a liking for his job.

- Communication skill: An effective communicator aims at clear comprehension of his message and desirable action by his audience. This will only be possible if he has communication skill, i.e. skill in selecting and treating his message and in the selection and use of channels.
- Understanding language and culture of the audience: The language and cultural compatibility of the communicator with that of the receiver positively affects communication fidelity. It will help in giving proper treatment to his message. He is the source, thus, the first to give expression to a message intended to reach an audience in a manner that results in correct interpretation and with a desirable response.
- Attitude: What does the communicator think about himself, his message and about the receiver of his message? An effective communicator assumes that his audience is intelligent, that he has a useful message to convey and that his audience is interested in it.

Since most of the time a communicator communicates verbally, it is important to locate the common cause for faulty verbal communication. Some of the faults are pointed out below:

a) Inattention and distraction.
b) Vocabulary differences.
c) Poor pronunciation.
d) Poor articulation i.e. inability to express one's thoughts in words.
e) Plural meanings.
f) Associations, i.e. meanings attached to a message because of past experience.

6.4.2 *Treatment of the message*

Treatment of the message means the way a message is handled to convey the information across to an audience. It is as important as the selection of the message. Treatment of the message refers to the decisions the source makes as to how he should deliver his message. Treatment is to make the message clear, understandable and realistic to the audience; it is a creative task and needs special skill and training in arranging both code and content. Effort should be made to make message comprehensible, valid and useful. Treatment of the message plays a significant role in making it interesting or dull. A message logically organized in understandable terms gets a better reception. In order to give it proper treatment it is essential to understand the audience, its needs and its resources. Treatment of message should be with intention to make it

suitable for the respondents rather than for the communicator. As stated earlier, most messages are transferred orally. It is, therefore, essential to be a good speaker. The communicator can become a good speaker if he strives to be clear, knows the facts, knows the audience, talks nicely to the audience and is sincere in his work.

6.4.3 *Message*

Every communicator has important information and ideas which he wants to convey to the audience in such a way that they are received and interpreted as intended. A good message should make the individual feel a need which he can satisfy by action and suggest ways to fulfil the same. A good message is valid, unambiguous, comprehensive and of use to the receivers. Credibility of the source and channel are equally important. Intentions and expectations, in consonance with all other conditions, increase the validity of the message.

Comprehensibility of the message will be enhanced if it is clear, conveys the intended feelings and is prepared from the receiver's point of view. Any ambiguity in the message can be reduced by making the meaning and intentions common for both the communicator and the receiver. A good message is that which fulfills the following criteria.

(a) Communications: A good message is easy to communicate and the communicator has full command of the contents.

(b) Social and economic risk: Less the social and economic risk, the greater will be the acceptance of the message which should be in line with the beliefs, values and economic capabilities of the receivers.

(c) Simple: A message must be easy to understand and will be popular among the receivers as compared to a complex message.

(d) Divisibility: Sometimes the receiver may not be having sufficient resources to accept the message in full, or he does not want to take a big risk. As such he may like to have a trial on a small scale. A message that can be divided or can be tried on a small scale, is often more acceptable.

(e) Related and accurate: The message must be well-tested under local conditions before its dissemination. Its contents should be accurate and relevant to the receiver. It should be something of interest to him.

6.4.4 *Channels of Communication.*

A channel is the medium or vehicle which carries the message. It is the

physical bridge between the sender and the receiver of the message. It may be anything used by the sender to connect him with the intended receivers. All teaching methods are channels of communication. But these channels lose their advantages unless these are used in the right way, at the right time, for doing the right job, with the right audience. Channels are the connecting link between communicators and receivers, therefore they must effectively join together these two essential elements of communication process. Channels can be local or cosmopolite, but their selection and use depend upon the need and type of audience. They can also be classified as inter-personal and mass media. It has been found by many research studies that mass media channels are more important at the knowledge function and for early adopters, whereas inter-personal channels are more important at persuading function and for late adopters. To minimize channel noise and to improve the effectiveness of channels, some of the important factors are listed below:

i) Availability: Only those channels should be selected for use which are available locally and with which receivers are familiar. Avoid the use of channels, as far as possible, which are foreign to the receivers.

ii) Cost: Preference should be given to cheap and simple channels. They are easy to obtain and to handle.

iii) Preference of the communication: Only those channels of communication should be used which can be handled by the communicator skillfully. For example, if the communicator is not trained in group discussions or in conducting method demonstrations, the effectiveness of this channel for carrying the message is likely to be reduced.

iv) Suitable to the content and receiver: Only those channels which are at the level of the ability of the receivers and are suitable to the message should be used. Every channel cannot be used for every message and for all types of receivers.

v) Frequency of use: Repetition of the message enhances its acceptability. More the channels a communicator uses in parallel or at about the same time, the more chances are for the message getting through and being properly received.

vi) Effectiveness: channels must effectively bring together the sender and receiver. Failure to select channels appropriate to his objectives by the communicator, or use of too many channels in a series, adversely affects the performance of the channels. Overloading the channel also increases the chances of error.

6.4.5 *Audience*

The receiver of the message is known as audience. An audience may consist of one or more persons, may be men, women or youth. The

personality and the standard of the audience have a significant effect on the process of communication. It depends upon the efforts made by the receiver in understanding, interpreting, accepting and actual use of the message. The following characteristics will help in getting desirable response from the receivers:

1. Needs: It is always important to study the needs of the audience. Without this knowledge, a communicator cannot move forward with confidence. A wise communicator will study his audience and try to determine which kind of needs they consider to be most important for them and will base his approach accordingly.
2. Knowledge level: It is a well-tested principle to have basic knowledge about the audience.
3. Attitude: People will cooperate only if they have a receptive attitude towards learning. When the audience receives satisfaction as a result of the communicator's assistance, it seeks further assistance. Decoding of the message is in part also determined by his attitude.
4. Available resources: Good teaching requires a thorough study of the audience, study of the available resources and present level of technological adoption. If the message is beyond the reach of the audience, it will never make efforts to listen to it.
5. Socio-cultural system: Communication failure occurs many a time when the message is contrary to the accepted local customs and beliefs. Recognizing this danger beforehand, planning an alternative approach to the problem is an essential part of successful communication.
6. Past experience: Previous experience serves to stimulate new learning, and new learning is built upon previous experience. If the previous experience is satisfactory, the new learning will be fast and easy.

Finally, the success of rural development programmes directly depends on the transfer of useful knowledge from a reliable source to the people who need it. The transfer must be made in such a way that, when received, the idea results in action.

For further details, please read the below referred material.

Charles T.Meadow and Albert, S. Tedesco, (1985)	Telecommunication for Management, New York, McGraw-Hill Book Company, PP.12-36	6-2

6.5 PROBLEMS IN COMMUNICATION

The act of communicating involves the relaying or transmitting of s sign or symbol--verbal, written or pictorial--from a specific source to a specific audience or receiver by means of anyone, or all, of several media that act as channels for transmission and for the express purpose of influencing the opinion and actions of the receiving individual or groups. The world has never seen a time when the role of the communicator has been as important as it is today.

The essence of communication, then, is getting the receiver and the sender tuned together for a particular message. Good communication does not merely consist of giving orders, but of creating knowledge, and helping people to gain a clear view of the meaning of knowledge. Certainly, in rural development nothing is more important than the transfer of useful ideas from one person to another. In this process of communication lies the potential for millions of village people to overcome ignorance and to attain social well-being. Much misunderstanding results from faulty communication. Too many people saying the wrong thing, at the wrong time, in the wrong way, to the wrong people slow down the progress. What is needed is more people saying the right thing at the right time, in the right way and to the right people. This is the formula for good communication.

Communication is a process of proceeding on a series of actions or operations definitely conducive towards a desired end. Each episode of communication has at least three phases; expression, interpretation and response. These are the crucial points in communication. If the expression is not clear, the interpretation inaccurate and the response improper, one's efforts to communicate will not succeed. It is one thing to express ideas, even to get information to people, but quite another to get ideas as widely interpreted as intended and responded to as desired. In more clear terms, if the message is not encoded fully, accurately, effectively in transmittable signs, if these are not transmitted fast enough and accurately too, despite interference and competition to the desired receiver, if the message is not decoded in a pattern that corresponds to the encoding, and finally, if the destination is unable to handle the decoded message so as to produce the desired response, then, obviously, the system is working at less than top efficiency.

For more clarity, these problems of communication can be classified through various methods. Some of these methods have been described below:

6.5.1 *According to phases of Communication*

Every communication process has at least three phases. Common problems being faced at each phase of communication are as follows:

(a) *Relating to Communicator*

1. Ineffective environment: The environment created by the communicator influences his effectiveness. The physical facilities, air of friendliness, respect for others' view, recognition of accomplishments of others, and permissiveness and rapport in general are all important ingredients of climate conducive to effective communication.
2. Unorganized efforts: To make sense, the communication efforts must be organized according to some specific form or pattern. Unorganized efforts will distort the message and it will not reach its destination as intended.
3. Standard of correctness: This involves the proper selection of the message and its level of accuracy. The message must have correct contents or facts. The communicator must be very careful in selecting and testing the local applicability of his message.
4. Standard of social responsibility: This refers to a situation when one communicates, one assumes responsibility for the effect of one's communication on the respondents and the society. Awareness of this fact will force the communicator to be more careful, serious and honest.
5. Cultural values and social organizations: Cultural values and social organizations are determinants of communication. The communicator must have knowledge of the cultural and social values of his listeners for an effective communication.
6. Inaccurate symbols: The system of symbols used to represent ideas, objects or concepts must be accurate and used skillfully. The crucial points in the use of symbols to convey ideas is to select those that accurately represent the idea to be conveyed and are understood by the audience. Symbols are meaningful to a person only when he understands what they stand for.
7. Wrong concept of communication process: A common mistake committed by the communicator is the identification of the part with the whole or the 'part fallacy'. Successful communication requires a series of unit acts. The way one thinks about communication will influence its quality.

(b) *Relating to the transmission of message*

Many obstructions can occur at the interpretation level. These are often referred to as 'noise', that is, some obstruction that prevents the message from being heard by or carried over clearly to the audience. Noise emerges from a wide range of sources and causes which affect the interpretation of the message.

1. Wrong handling of channels: If a meeting, tour, radio programme or other channels are not used according to good procedure and technique, their potential for carrying a message well disappear.
2. Wrong selection of channels: Every channel is not equally useful in attaining a specific objective. Failure to select channels appropriate to the objective of a communicator will interrupt the interpretation of the message in the desired way to the intended audience.
3. Physical distraction: Failure to avoid physical distractions often obstructs successful message - sending, because they create physical barriers between the communicator and the audience.
4. Use of inadequate channels in parallel: The more channels a communicator uses in parallel or at about the same time the more chances he has for the message getting through and being properly received.

(c) *Relating to receiver*

1. Attention of the listeners: An unfortunate tendency among people is not to give undivided attention to the communicator. This is powerful obstruction for the communicator, and prevents the message from reaching the desired destination.
2. Problem of cooperation, participation and involvement: Both the communicator and the receiver must be brought into the act. Hence, the listener too must work a little. Learning is an active process on the part of the listeners. Unless the respondent is on the same wave-length, the character of what is sent out will hardly help the communication process. So, it takes both the communicator and the listener to make communication.
3. Problem of homogeneity: The more homogeneous the audience is the greater are the chances of successful communication. Likewise, the more a communicator knows about his audience and pinpoints its characteristics, the

more likely he is to make an impact.

4. Attitude of the audience towards the communicator: An important factor in the effectiveness of communication is the attitude of the audience towards the communicator. Indirect data on this problem come from the studies of 'scholars' in which subjects are asked to indicate their agreement with statements which are attributed to different individuals.

6.5.2 *According to Various Types of Problems*

Communication problems are generally of three types:-

1. Technical problems: Such problems are concerned with the accuracy of transference of information from sender to receiver. They are inherent in all forms of communication, whether by sets of separate symbols (written speech) or a varying signal (telephonic, radio, transmission of voice or music) or a varying two dimensional pattern (television). In the process of transmitting the signal, it is, unfortunately, characteristic that certain things not intended by the information source are added to the signal. These unwanted additions may be distortions in the shape of shading of a picture (television) or error in transmission. All these changes in the signal are called 'noise'.
2. Semantic problems: Such types of problems are concerned with the interpretation of meaning by the receiver as compared with the intended meaning of the sender. This is a very deep and involved situation, even when one deals with the relatively simple problems of communicating through speech. In the restricted field of speech communication, the difficulty may be reduced to a tolerable size, but never completely eliminated by 'explanations'.
4. Influential problems: The problems of influence or effectiveness are concerned with the success with which the meaning conveyed to the receiver leads to the desired conduct on his part. It may seem at first glance undesirably narrow to imply that the purpose of all communication is to influence the conduct of the receiver. But with any reasonably broad definition of conduct, it is clear that communication either affects conduct or is without any discernible and provable effect at all.

Another method classifying these problems can be according to their nature, such as:

1. Physical problems: The possible disorders affecting communication fall generally in the following categories: speech paralysis;

characteristics of physical appearance which interfere with expressive bodily action or which tend to call forth unfavourable reactions on the part of the audience; lack of skill in the use of background of staging techniques; together with defects, such as radio stasis in the means and conditions of transmission.

2. Psychological problems: Accurate and adequate communication between groups and people will not in itself bring about the best transformation but it is a necessary condition for almost all forms of social progress. Physical barriers to communication are rapidly disappearing, but psychological abstracts remain. These psychological difficulties are in part a function of the very nature of language, in part they are due to the emotional character and mental limitations of human beings. These general considerations concerning the psychological nature of language are the background against which more specific difficulties in communication can be understood.
3. Cultural problems: Cultural differences pose a serious barrier in the communication process. Within this expanding field of activity, one can distinguish three short questions: (a) the way in which a communication system is related to given cultural values, (b) the particular ethical problems of responsibility realised by our current use of communication systems, and (c) problems of communication when cultural boundaries have to be transcended.

However, one of the major problems of communication policy and technique is to find ways of controlling the interpretation which an audience will place upon events and actions. People are swayed not merely or even primarily by what is said. More important is what is done and what happens.

The two things we can say with confidence about communication effects are that they are resultants of a number of forces of which the communicator can really control only one. The sender, that is, can shape his message and can decide when and where to introduce it. But the message is only one of at least four important elements that determine what response occurs. The other three are the situations in which the communication is received and in which the response, if any, must occur, the personality state of the receiver and his group relationships and standards. These so-called 'road blocks' to effective communication are not easily overcome. In the absence of a hard and fast rule or solution, however, there is always the possibility of common agreement on understanding that 'road blocks' exist and that the line of communication

is not always simple, clear and direct but frequently rocky and indirect.

Finally, it can be said that problems in communication usually stem from such things as the language used, the meaning of words, being specific, organizing messages, using channels of communication , knowing one's audience, developing and understanding of facts, and helping people to recognize the importance of the facts, and their relationships to problems. But the communicator should be constantly concerned about the question: what impact is the speaker making on the people? What happens to people as a result of the communication? So that these common problems can be eliminated as far as possible to make the communication successfully.

For further details, please read the below referred materials.

Usha Rao (1991)	Educational Technology, Bombay, Himalaya Publishing House, PP.35-43.	6-3

6.6 THEORIES OF COMMUNICATION AND MODELS

According to Berlo (1960) the sole purpose of communication is to influence, whereas Sean MacBride et al. (1980) is of the opinion that the functions of communication are to inform, command and instruct, influence and persuade and integrate. The process of communication is an act of proceeding on a series of actions or operations definitely conducive to a desired end. In order to understand the communication process fully, it is important to have an idea of some of the important theories of communication.

6.6.1 *Linguistic Theory of Communication*

Man has the ability to invent and use almost limitless combinations of sounds. The sounds that the human being makes are known as 'speech' and the language is the total sum of these sounds. Speech is the most immediate and flexible way of communicating with each other.

Every language has two key units, 'phoneme' and 'morpheme'. Phoneme is the unit of description of the sound system of a language. It is the minimum distinctive feature into which any given flow of speech can be divided. Morpheme is the basic unit for grammatical description. It is a fundamental meaningful unit of grammer which is recurrent in nature. Language is the best system of communication as compared to the vocalization and kinesics systems of communication. But, there is always the presence of vocalization and kinesics in addition to proper language communicating.

In order to communicate effectively, one should know how to put together one's words that are useful and acceptable and how to convey the message without disturbing the feelings of others. Control on vocal channel and emotions is also essential. To be a successful extension worker, a person should make sure that the people always understand him and he understands the people. He must have their confidence and feel free to say what he wants to say.

6.6.2 *Mathematical Theory*

In this theory, two more elements are added in addition to the already discussed four elements of the communication process. These are: Transmitter and the receiver. Transmitter is a device that changes the message into a signal or symbol which is actually sent over the communication channel from the transmitter to the receiver by the source. Receiver is the opposite of the transmitter; it changes the transmitted signal back into the message or reconstructs the message from the signals before it reaches its destination. In this theory, information relates to what can be said and not what is said. Information is a measure of one's freedom of choice when one selects message. Main concepts involved in this theory are: amount of information, capacity of the channel, effects of noise and coding process. Channel capacity depends upon band width and time. For continuous signal maximum capacity is:

$$C = W \log_2 \frac{P + N}{N} \text{ bits/Sec}$$

W = Frequency band width.
P = Average signal power.
N = Average noise power.

The coding process should be according to capacity, nature and statistical characteristics. Effect of coupling is also accounted for. The gate-keeper may filter out, fade, boom or distort the information.

6.6.3 *Information Theory*

Human communication is merely a chain of coupled systems. They are often very long in mass communication. Concepts of entropy and redundancy have great significance in information theory. Redundancy is a measure of certainty or predictability. More redundant a system is, the less information it is carrying in a given time. But at the same time increasing the redundancy will improve the efficiency of communication.

Entropy means the uncertainty or disorganization of a system. The lower the redundancy, the higher the relative entropy. Noise is anything in the channel other than what the communicator puts there. It is a competing stimuli from inside or from outside. An increase in redundancy may combat noise. Net-work is another concept commonly mentioned in information theory. It is considered that every functional group is a communication net-work. To understand the communication in groups it is better to study traffic, closure and congruence. The entropy of communication within a functional group decreases as the group becomes fully organized into work roles. Similarly, with the increase in leadership perception, relative transitional entropy of communication in the group also decrease. The total time required to do the job and the amount of communication decreases as the organization becomes more stable.

6.6.4 *Models of Communication*

Different communication specialists have different opinions regarding the system of flow of information from source to the receivers. A brief description of the common and important communication models is given here:

a) Single-step flow of communication: This model is based on the assumption that information reaches directly from the source to the receiver in communication. Sampath, K. et al (1994) on the basis of research findings, proposed the model of one-step flow of communication. This model is contrary to the earlier model of two-step flow of communication. Single-step model states that mass media channels communicate directly to mass audience without the message passing through opinion leaders.

b) Two-step flow model: Sean MacBride and others (1980) proposed that influences stemming from the mass media first reach 'opinion leaders' who, in turn, pass on what they read and heard to those of their everyday associates for whom they are influential. Opinion leaders are more exposed to the mass media than those whom they influence. This model implies that opinion leaders are active while their followers are passive, which is not true in every situation. There may be many non-leaders in direct contact with the mass media.

c) Multi-step flow model: It is not desirable to limit the flow of information to one or two steps. The number of steps differ from situation to situation and the flow of communication is far more complicated than two steps. As suggested by Susan B. Shimanoff (1980) the exact number of steps in the process depends on the intent of the source, the availability of mass media, the extent of

audience exposure, the nature of the message, and importance of the message of the receiving audience.

6.6.5 *Characteristics of Mass Audience*

In order to fully understand the flow of the communication system and its use, it is desirable to have a knowledge of mass audiences. This information will be of great help in proper planning and execution of mass media projects.

1. Size: Size of the mass audience is much larger as compared to groups and even small communities.
2. Scattered: Mass audience is not confined to a single place. It may be scattered in geographically far-away places, even crossing the national boundaries.
3. Heterogeneity: Mass audience is a mixture of every kind of persons. It may have persons living at different places, different in age, interest, occupations, status, etc.
4. Unknown audience: The producers of mass media are unaware of their audience. A radio announcer cannot know who the listeners are. The same case is with other types of mass media, too. Even audiences themselves do not know about their fellow receivers.
5. Unorganized: The mass audience does not constitute an organized group. It is without a common leader and a well-defined programme of action.
6. Non-attachment: As mass audience is scattered at different places and has no knowledge of each other, no attachment exists with one another.
7. Unstable: Audience consists of undefined mass of people which is contrary to the organized known groups. It may also not be the same in different situations and at different times.
8. Individualism: Exposure to mass media leads the society towards modernization. This process breaks the traditional societies and gives birth to individualism.
9. Cosmopoliteness: A society where literacy and industrialization is high, depends more on mass media chains. Mass audience is generally more cosmopolite, better informed, and more active.

6.6.6 *Controls on Mass Media*

As stated earlier, mass communication can prove dys-functional in certain situations. Instead of providing correct information and healthy entertainment, it may provide services which are undesirable from the point of view of the welfare of the society and its members. This may happen for monetary, political or religious gains and other benefits.

Therefore, there must be some check on the mass media. This check or control can be provided by the following agencies:

i) The Government.
ii) The public.
iii) Self-check by the media.

Too much control of the government is contrary to democratic principles and freedom of the Press. Moreover, under such conditions the media can hardly report freely about the government. It is the responsibility of the public to make its needs, wishes and dissatisfaction known to the mass media. A strong public opinion can always bring about changes in the mass media, because style of mass media is affected by the responses of the public. Media itself should be bold enough to carry self-criticism and also follow the prescribed code of conduct. In this why, proper control can be maintained on the mass media to avoid its dys-functional and anti-public actions.

For further details, please read the below mentioned material.

Kulkarni, S.S. (1989)	Introduction to Educational Technology, New Delhi, Oxford & IBH Publishing Co. PP.122-140.	6-4

6.7 COMMUNICATION AND EDUCATION

In the class we carry on communication through language spoken or written. The spoken word dominates. According to Jean Piaget, early speech of children is eco-centric. They interpret words and use them in their own limited personal experience. They do not realise that others have different concepts. Only by 7-8 years does socialised speech develop. The eco-centricity of speech is due to inability of the young child to think about more than one thing at a time. Good teaching is more than this communication. It is not good if the child merely repeats the same word as conveyed to it. The concern of the teacher is that the child should recognise the word, understand the meaning and use it correctly.

John Corner & Jermy Hawthorm, ed. (1980) state: "Teachers should know several things about communication. Developing communication skills in children is the basic concern of the school and hence teachers must provide ways and means of developing and improving the skills. Teacher must realise the constant influence of several communication media outside the classroom upon the student. The words that the children seem to possess before entering school were all learned through various media. Teachers must capitalise on the students'

conditioning to these media and must relate them to the school activities. Communication can occur only when the teacher and his pupils share common meanings and experiences."

In order to see what effects technology has in communication systems, please read the book mentioned below.

Garrison, D.R. (1989)	Understanding Distance Education, London, Routledge, PP.9-22.	6-5

6.8 SOLUTION OF MEDIA FOR EFFECTIVE LEARNING

These modern media are among the tools that the education profession uses to mould and shape human minds. Good teaching in fact is intercommunication. There must be reaction and interaction with constant feedback. The message conveyed by the teacher and or the educational media may be verbal or visual and the receiver may listen, see or examine and react in other ways. The communication channel in the classroom should ideally carry both messages and counter messages.

Media is very important in teaching-learning as it is the chief means by which the teacher and the taught work together. It helps them to hold together by making it possible for them to influence and to react to each other. In fact communication is so fundamental that without it the organization cannot exist.

A teacher might theoretically develop his plans and procedures and the requisite organizational structure, but when it comes to implementation, he has to communicate this to his students. Unless the teacher has a communication skill, participation from the students may become difficult.

Media covers the equipment aspects of the technology, and the constraints and opportunities it provides for the student and the instructor to achieve learning.

Media places severe constraints on the use of modern communication technologies in education. In can dictate the type of learning which will follow, the nature of the programme design, the level of participation and activity of the learner, and the organization needed to enable learning to take place. Good examples of such constraints are found in broadcast vs tape and disk technologies. There the development of the audio cassette meant that the control of radio broadcasting over content, timing, integration with other media such as photographs, slides and printed matter could be passed to the student, and that consequently a great diversity of programmes could be developed.

However, careful selection of media by the teacher and proper use in the teaching-learning process can make learning purposeful. For further details, please read the below referred material.

E.G.Vedanayagam. (1994)	Teaching Technology for College Teachers, New Delhi, Sterling Publishers Private Ltd. PP.148-159.	6-6

6.9 ACTIVITIES

1. Write below a working definition of communication.

_____

_____

_____

2. Prepare a chart showing the problems of communication.

3. Draw a diagram indicating the theories and models of communication.

4. Discuss communication effectiveness in the teaching-learning process with any educationists of your area and prepare a report of the outcome of your discussion.

5. List below the basic principles of communication.

_____

_____

_____

6. Draw a diagram indicating the media to be used for effective communication in learning.

6.10 EXERCISE

Hopefully you have studied the referred material, now please answer the following questions.

Q.No.1 Offer a working definition of communication.

Q.No.2 Discuss the nature and need of communication.

Q.No.3 Critically examine the elements of communication in education.

Q.No.4 Discuss the role of communicator. What care should be adopted in the teaching-learning process?

Q.No.5 Critically examine the theories of communication.

Q.No.6 Explain the models of communication. Which model do you think more suitable for Pakistan? Also highlight the parts of the model.

Q.No.7 Discuss the differences between speech and the written word.

Q.No.8 Evaluate the non-verbal factors in oral communication.

Q.No.9 Discuss the basic principles of a good communication.

Q.No.10 Critically examine the channels of communication.

Q.No.11 Discuss the problems involved in communication.

Q.No.12 What measures are required in the selection of media for effective learning? Also discuss the role of the teacher in the selection of media for learning.

Q.No.13 Write a short note on the following.

1. Treatment of the message.
2. Message.
3. Linguist theory of communication.
4. Information theory.
5. Characteristics of mass audience.
6. Phases of communication.

6.11 BIBLIOGRAPHY

1. Charles T. Meadow and Albert S. Tedesco (1985) — Telecommunications for Management, New York, McGraw-Hill Book Company.

2. Colin Mares (1966) — Communication, London, The English Universities Press Ltd.

3. David K.Berlo(1960) — The Process of Communication: An Introduction to Theory and Practice, London, Holt, Rinehart and Winston, Inc.

4. E.G.Vedanayagam, (1994) — Teaching Technology for College Teachers, New Delhi, Sterling Publishers Private Ltd.

5. Garison, D.R. (1989) — Understanding Distance Education, London, Routledge.

6. Harris, N.D.C. (1979) — Preparing Educational Material, London, Croom Hlem.

7. John Adair (1973) — Training for Communication, London, Macdonald.

8. John Corner & Herent Gawtgrim, ed (1980) — Communication Studies: An introduction reader, London, Edward Arnold.

9. John Parry (1970) — The Psychology of Human Communication, London, University of London Press Ltd.

10. Kulkarni, S.S.(1989) — Introduction to Educational Technology, New Delhi, Oxford & IBH Publishing Co.

11. Peter Little (1973) — Oral and Written Communication, London, Longman.

12. Rashid M. (1993) — Educational Technology: Study Guide, Islamabad, A.I.O.U.

13. Raymond Williams (1966) — Communication, London, Penguin books.

14. Sampath, K. Panneerselvam A, Santhanam, S.(1994) — Introduction to Educational Technology, 3rd, ed. New Delhi, Sterling Publishers, Private Limited.

15. Sean MacBride and others (1980) — Communication and society, Today and Tomorrow, Many Voices One World. A report of international commission for study of communication problems. London, Kogan Page (Unesco).

16. Susan B.Shimanoff (1980) — Communication Rules: Theory and Research, London, Sage Library of Social Research.

17. Usha Rao (1991) — Educational Technology, Bombay, Himalaya Publishing House.

18. Wilbur Schramm (1960) — Communication, University of Illionois Press Urbana.

Unit No.7

PLANNING AND PRODUCING OF INSTRUCTIONAL MATERIALS

By
Dr. Muhammad Rashid

7.1 INTRODUCTION

Instruction is a process of sharing ideas between the teacher and the taught. Teacher uses all possible resources at his disposal to get cross his message to his student, whereas the learner tries to utilize those resources in making learning a relatively permanent change of behaviour. The presence of such resources appeals to one or more senses of the learner in order to stimulate him for action. The main stress of teaching-learning resources is to motivate the learner for useful learning activity. It is this involvement of the learner that helps him to clarify images being imbibed.

Human beings learn through their senses. Mostly, we use our hearing to gather information. Auditory stimulation is the main-stay of knowledge gained by a person whether he is illiterate or learned. Visual observations are the second big source of taking in impressions. Then, the tactile sense comes to our help to manipulate the things around us. We smell before we taste a thing. After using our olfactory sense to gain knowledge we seek the assistance of taste to discriminate between sour or sweet.

We have five senses as the main source of information. The thinking process depends upon these sources. It works on the collected information and its organizations into systems. It becomes almost necessary to utilize as many senses as possible in acquiring information so that the mind can evaluate them to form information systems.

Greater the number of senses used in a learning process, better will be the images formed. We listen to many things and try to confirm them through visual impacts. We want to manipulate whatever we have visualized. We intend to smell and/or taste to supplement our observations. To this we go on adding one sense to the other in order to be more clear about an idea. Once an idea becomes strong in our mind, it is hard to forget it. Our senses assist us in forming mental images which are relatively permanent.

Sensory aids are not the end in themselves, rather they are means to achieve the objective of making the learning process strong and viable. They assist a teacher but do not replace him. It is the skillful use of sensory aids that reinforces the association of ideas and strengthens configurations. A teacher exerts efforts to transmit a message to a student's working or permanent memory. The audio-visual aids try to make perceptions clear and invite the learner's attention to convert sensory images into mental symbols. The learner responds to these symbols formed in his mind through some sort of action (say, questioning, answering, or performing, etc.) and, thus, provides a feedback confirming the effect of learning on his mind. The audio-visual aids work as channels of

communication between the teacher as a sender and the student as a receiver of the message. The redundancy effect of a sensory medium is overcome by the use of the second one and, hence, it increases the chances of making images more clear and perfect.

It is an interesting phenomenon that even the introduction of letters and numbers to a first-grader requires to use of visual materials like a chalkboard or instructional toys. The primary concepts about life are conveyed through the use of aids. A verbal symbol of "water" is associated with the non-verbal symbol of "actual water" and soon, once the concrete facts are presented to the senses, the concept formation becomes easier. One can easily conceptualize a satellite by watching a film on it. Initial learning, when assisted by instructional aids, becomes nearer to the resultant learning.

Knowledge is the fund of human experiences. We get some experiences ourselves, while others come through listening. As listening alone does not provide a clear image, we supplement it with contrived experiences of others in the form of audio-visual aids like models, charts, pictures and films. Such aids reduce the time gap between our present and our past. The past is more rapidly presented to our senses through sensory aids which make past experiences visible and assure their validity. Solid aids (like objects, models, diagrames), ink aids (like charts, instructional sheets, and books), and slide projections (like transparencies, slides and films) combine together to bring the human past into our presence within the shortest possible time. It thus reduces our labour to conceptualize past experiences. The time, money and energy so saved can be utilized to acquire newer and more information, skills and attitudes.

With these aids more curricular contents can be presented to the learner in a short time and with limited human and material resources. We can also with the assistance of audio-visual aids, provide wider and broader information to our learners.

Another reason for using audio-visual aids is their role in individualized instruction. Individuals differ from one another in intelligence, opportunities and interests. Audio-visual aids help the individual to follow his own pace and pursue learning according to his particular ability and interest. He can use a chart to read out important facts and concepts, consult instructional sheets to learn course contents, watch films and videos to improve subject matter deficiencies, run a computerized instructional programme to receive feedback of learning, etc. Instructional aids stimulate self-activity of a learner to pursue learning at his own pace. Self-pacing is one of the benefits derived out of teaching aids.

The below average teacher may not like the use of audio-visual aids in the classroom. The reason is simple enough. He has either to find an aid or to make it. He has to work hard which he does not like. An average or above average teacher puts in his optimal efforts to employ workable teaching methods and worth-while aids to make instruction interesting and to maintain a good level of attention. Good teachers use all sorts of aids.

Availability of audio-visual aids is a matter of managerial skill. A good manager would like to procure teaching aids to improve the learning process. He would need an amount equal to about 15 percent of the total salaries of the staff to bring, maintain, and utilize teaching aids. But it depends upon his own knowledge of the instructional aids and their benefits.

During instruction, a student forms the image of the concept learned. He is continually forming definite, vivid and growing images of the various concepts with which he comes into contact through experience. A teacher can more wisely and profitably, utilize his and the student's time in forming these images through long discussion and utilizing an appropriate teaching aid. Formation of images is an important role-played by instructional aids.

Characteristics of an Instructional Aid

An instructional aid is a specifically prepared device to expedite learning through the senses. It must possess the following characteristics:-

1. It should explain an abstract idea, show a procedural sequence that may not be clear enough without it.
2. It should be visible to the class.
3. It should not be confused by un-necessary details.
4. It should be made of local materials.
5. It should be portable and easy to handle.
6. Charts, drawings, etc. should be properly protected by suitable material.
7. It should be cheap and locally available.

Effort has been made in this unit to highlight all the aspects of planning and production of instructional materials.

7.2 OBJECTIVES

After studying the unit, it is hoped that the student will be able to:-

1. discuss the role of educational objectives and media in planning and producing of instructional materials;

2. explain the curriculum content and the relevant media for producing instructional materials;

3. specify teaching strategies/models and media to be used in teaching;

4. appreciate the role of media in effective teaching; and

5. discuss the production process of instructional materials.

7.3 EDUCATIONAL OBJECTIVES AND MEDIA

Educational objectives are statements which describe the kind of modification that we want to bring about in the learner. The objectives provide the necessary direction and function for the entire educational structure. There are many objectives of education, like knowledge, understanding, application, etc. If learning experiences are based on clear cut objectives, evaluation is the next step to measure whether the objectives have been achieved or not.

Benjamin Bloom's Taxonomy (1956) of educational objectives attempts to classify educational goals under three domains; cognitive domain, affective domain, and psychomotor domain, Bloom has also specified the major objectives under the first two. His scheme classifies educational objectives and relates each objective to specific classroom procedure. It further specifies a sequence of stages or levels of objectives that are matched to a sequence of evaluation strategies. Under the cognitive domain, Bloom lists six major levels of objectives -- learning facts, comprehension, application, analysis, synthesis and evaluation. The objectives of the affective domain include receiving (attending), responding value, organization and characterization by a value or value complex. Bloom has also attempted to specify the objectives of the psychomotor domain. Objectives as such cannot be evaluated directly as they cannot be observed and measured. Teaching is supposed to modify the behaviour of children and hence specific behaviour objectives must be stated. Curricular development must take into consideration the several learning experiences which must be specified in behaviour terms so that they can be evaluated. The paradigm of curricular development can be shown as under:

Feedback

- Formulation of specific instructional objective.
- Development of broad goals and specific behavioural objectives.
- Classroom behaviour.
- Characteristics of studies and teachers.
- Instructional procedure.

- Determining the extent and implementation of teaching- learning activities.
- Evaluation.
- Determining of extent to which the objectives have been realized.

Behavioural objectives refer to a student's actual ability to use what he knows. Statement of behavioural objectives includes conditions of performance as well as performance criteria for evaluation. The teacher should remember that each type of objective is not something that should be attempted to be achieved separately; all are intermoven in a complex of mental action.

For further details, please read the below referred material.

Unesco, (1981)	A Systems Approach to Teaching and Learning Procedures; A Guide for Education, Paris, the Unesco Press, PP.23-42.	7-1
Kulkarni, S.S. (1989)	Introduction to Educational Technology, New Delhi, Oxford & IBM Publishing Co. PP.53-77.	7-2

7.4 CURRICULUM CONTENT AND MEDIA

As you must be aware, almost all forms of formal and non-formal education are backed by some kind of programme. There is always a blue-print that maps out the directions which are to be followed. Such a programme, especially of formal education, does not deal only with learning activities in the classroom, it also pays attention to nearly all the activities concerned with the total personality of the individual. If the personality of the individual is involved, then a balanced programme of activities that contribute to his growth is important to educate the person as a whole.

Growth in this sense refers not only to the physical growth of the individual; but also mental and intellectual growth. But this in turn has some influence on the physical as well as social growth. Drawing up a good school programme offers ample opportunities for the educational processes envisaged to be in concert with the informal educational processes of the home and the society. Such a programme would take account of the relevant factors, necessary materials and activities that contribute to the development of the individual as a whole. The resources available for the implementation of time table objectives are considered so that the programme can be gone through successfully.

One of the most important blue prints of a good school programme is the curriculum which forms the core of the educational activities in the learning process. It is very important for teachers to understand clearly the major terms used in the educative process. These include curriculum syllabus, scheme of work, module, and so on.

In order to know more about curriculum content and role of media in Planning and Producing Instruction Material, please read the following materials martials:

Noel Entwistle (1988)	Styles of Learning and Teaching, London, David Fulton Publishers, PP.225-242.	7-3

7.5 TEACHING STRATEGIES AND MEDIA

There are many teaching strategies in teaching-learning process. In this section of the unit, we are going to discuss some important strategies or models of teaching.

Teaching strategies are just instructional designs. They describe the process of specifying and producing particular environment situations which cause the student to interact in such a way that specific change occurs in his behaviour.

Teaching strategies consist of guidelines for designing educational activities and environments. These strategies are meant for creating environments. They provide specifications for constructing learning situations. Strategies of teaching is a plan that can also be utilized to shape courses of studies, to design instructional material and to guide instruction.

Before acquainting oneself with the elements of teaching strategies, it is necessary to know the basis of determination or assumptions of these strategies. These are as follows:

i) Teaching strategies act as blue-print or framework for creating healthy atmosphere in the classroom.
ii) Inter-action of teacher and pupils is fundamental in the teaching process. It must be encouraged.
iii) Different methods should be used to make teaching as simple as possible.
iv) The teaching process is only a weapon to create the appropriate atmosphere.

The following characteristics of teaching strategies become clear on the

basis of a class study of the assumptions given above.

a. Teaching strategies depend on personal variedness.
b. There are some basic assumptions for teaching strategies.
c. They are also effected by the philosophy of education.
d. These strategies utilize the interest of the pupils.
e. A teaching strategy is developed through practice and attention.
f. Teaching strategies are also known as teaching skills.

Following are the elements of teaching strategies.

1. Focus: Every teaching strategy has a focus or a central point.
2. Syntax or Structure: Teaching strategies can organized properly to inter-act between teacher and pupil. The whole teaching process is directed towards this objective. This type of organization of inter-action establishes a connection between the steps of the process and the phases of activities.
3. Social System: The teaching process is a social process. Hence inter-action between pupil and teacher is organized at this stage. The main function of the element is to control and change the behaviour of the pupils. A teaching strategy has its own social process.
4. Support System: Future course of action is decided on the basis of support system. The main function of this element is to improve the teaching process and to bring profitable changes in it. It is connected with success or failure of the teaching process and shows if the strategy to be used in the teaching process is effective or not. The answer to this question is obtained through this element.
5. Principles of reaction: Principles of reaction means the ways in which teachers respond to the activities of students, and the behaviour the teacher and the reactions he expresses regarding the instructional strategy. It needs to be noted that there are certain teaching strategies for undesirable behaviour and indifferent attitude is manifested. In such cases the teacher has to try and modify the behaviour of the learners. In those teaching strategies where creation of mutual enquiry type behaviours are to be developed, the teacher can use different principles of reactions. He provides opportunity to students to express their views again and again and offers evaluation comments on them such as right, incorrect, does not present facts, etc.
6. Application: Application is treated as the final characteristic element of the teaching strategy. This element acquaints us with the application and utility of the teaching strategy, because every teaching strategy is used in its own special conditions.

7.5.1 *The Important Strategies/Model of Teaching*

Now we go on to discuss the following three strategies so that students may understand the importance and the need to develop them:

A. *Glasser's basic Teaching Strategy*

This strategy determines the relationship between teaching and learning. Bruce Joyce and Marsha Weil (1992) called this strategy the 'Classroom meeting strategy'.

This is known as the basic strategy because the fundamental principles of psychology are used in it. Glasser tried to understand the teaching process through this strategy. He has divided the teaching process in the following four elements:

i) Instructional objectives are determined before starting teaching. These are determined by the teacher before starting any process which is necessary to determine as to why this process is being adopted. The same thing applies to the field of teaching also. The main aim of teaching is to bring about a change in the behaviour of the student. How this change should be brought about with the help of teaching, the complete explanation of this aspect only is called Instructional objectives.

ii) The behaviour of students at the time of commencement of teaching process is called 'entering behaviour'. This entering behaviour includes the pupils' previous knowledge, level of intelligence, motivation and learning abilities.
It is the duty of the teacher to find out whether a pupil has expected abilities, intelligence, etc. On the basis of these abilities, the teacher selects the instructional objectives. Level of pupils is decided keeping in view the three facets of behaviour of the pupils' cognitive, affective and psychomotor.

iii) Instructional procedure is related to the activities used in teaching. A teacher takes his decision on the basis of these procedures. These procedures should not be static and should go on changing alongwith instructional objectives. If there is a difference between these instructional procedures and instructional objectives, the teaching and learning process will be affected adversely. Therefore, I.P. is functional part of I.Q. The interaction of teachers and pupils is organized under these procedures.

iv) Performance Assessment is used to test and observe the

level of achievement of instructional objectives in the pupil. This element also provides feedback to the other three elements i.e. the pupils and teachers come to know about their successes and failures. This element also evaluates the third element vis-a-vis the first and second elements. Distances are removed in these elements. Methods like observation, rating scale, questionnaire, projective techniques and interviews are used for this purpose.

The above four elements of teaching are closely related with each other and any one element affects the other.

B. *The Concept Attaining Model/Strategy*

Through concept attaining a pupil learns the similarities of the various aspects of atmosphere and also learns to establish a relationship between them. Our atmosphere is very complex and many things are embedded in it. Knowledge of facts is created through concept attainment. This knowledge expands the general mental abilities of pupils. Logic is also developed through concept attainment.

Special attainment will take place only when concepts are with us to take place before we decide about concept attainment. Concept attainment model was given by J.S. Bruner. The details are as under:

i) Focus: The main aim of this model is the development of inductive reasoning. By this model the students learn the description of this process by which they get the knowledge of classifying views, persons and things.

ii) Syntax: This element of the Bruner model passes through stages. In the first stage information is supplied to the students so that they may come to know the concepts with the help of examples. At the second stage the students analyse the supplied information with a view to understand the concepts. In the third stage the students prepare a written model of the analysis and devise concepts on the basis of un-organized information.

iii) Social System: Under this element the teacher controls all activities, but gives the students freedom of discussion at various stages of teaching. He also encourages the pupils to participate in the discussion which is a necessary part of this element. Thus a stage is reached when the pupils start

analysing the concepts and strategies.

iv) Support System: The nature of all information supplied to the students should be the same so that they may understand the concept. The subject matter should be so organized as to make the students able to understand the concept. For this a strategy is used in which knowledge of new concepts is given to the students. In the evaluation of performance, essay type questions are used in the examination, because written examination is more helpful.

v) Application: Concept attainment model is used to learn languages and it is also helpful in learning mathematics. In other areas of knowledge also this concept is quite useful.

C. *Inquiry Training Model*

Knowledge is changeable and dynamic. It is never static. New principles are brought into being by scientists, but these principles too require changes after the passage of time and new principles take the place old ones. Therefore, knowledge is a dynamic process. That is why people go on doing research in the areas of their interest to acquire new heights in knowledge. This research work makes it necessary to adopt an enquiry process. Conclusions are drawn on the basis of hypothesis to find out the real reasons for a given event. When inquiry is done in an organized manner or on scientific basis, it is called inquiry process. In this method generation of principles comes out as a result of organization of knowledge.

This model was developed by Richard Suchaman. It helps independent learners. The pupils are given scientific education so that they may get training for undertaking natural research. The main aim of inquiry training is to develop the mental horizon and skills of the pupils, because they are necessary for searching answers to various interests and puzzling questions. According to Bruce Joyce and Marsha Weil (1992) it helps the students to develop independently the disciplines and skills necessary to raise questions and search for difficult answers stemming from their curiosity. Suchaman intends to help the students in independent learning. But an organized process of inquiry training starts from puzzling or difficult events. Suchaman believes that the pupil feels encouraged to solve such events by facing them. Therefore, we can suggest this method for organized research.

Inquiry training model has the following elements:

i) Focus: The main aim of this model is to develop intellectual skills of the students. The pupil learns by analysing the concept in a logical manner and by doing research in the given area. Individual abilities are appropriately developed by this model. The main function of this model is that the pupil should be able to learn and inquire independently. The pupils feel curious to solve a difficult problem whenever they come to face it. We can suggest organized methods to help them.

ii) Structure: This mode is structured in five phases:

a) The teacher presents a puzzling situation to the students and acquaints them with inquiry methods. No doubt, his final aim is to create new knowledge in the students. But preliminary enquiry is based on general ideas. The initial question should be such as agree with Yes or No answers. In this method a pupil is free to seek help from his other classmates and collects enough information with a view to look for his hypothesis.

b) In the second phase data is gathered for the purpose of verification. First of all 'yes' or 'no' answers will be asked. Secondly, the pupils will gather information and inquire about the event which they see or feel. During verification, questions can be asked about objects, properties, conditions and events. About things, such question can be asked as "What is this made of"? In this manner a teacher can explain the inquiry started by the pupils.

c) In the phase of experimentation the students get acquainted with new elements. Two things are done in this phase--exploration and direct testing. The changes are reflected at the stage of 'exploration' and hypothesis or principles are tested in direct testing.

d) In the phase of collecting information, it is organized during data collection. The teacher asks the pupils to draw conclusions and to explain the results of a particular event but the pupils can come out with defective explanations. The pupils are asked to give explanation so that difference of opinion can be seen and the explanation may be given satisfactory shape.

e) Under the phase of analysis of the inquiry process, the pupils are asked to reflect on the problem strategies that they use during the process of inquiry. As a result they are liable to develop more effective strategies. But they may reflect defective definitions. Above all, analysis of the whole inquiry process helps in finding out suitable solutions to the various issues involved i.e. the main problem, right strategies from all the students so that individual differences are observed, and right information collected, are affiliated and analysed.

iii) Social System: Social system is a necessary element of this model. According to this element, the teacher and the pupil play the main roles in teaching learning process. The teacher encourages the pupils towards inquiry. In the beginning he has more control but the pupil's freedom is slowly increased and the teacher's control is reduced. As a result, an open atmosphere or cooperation is created between the teacher and the pupils which develops a scientific point of view and abilities for solving puzzling situations. The success of this model depends entirely upon teacher-pupil cooperation. In this way the learners are helped to become more and more social and friendly.

iv) Support System: This model is used to enable the students to develop inquiry materials. The pupils are acquainted with difference problems and examples are given. For its evaluation, several tests are also given. Above all, the teacher has to see that appropriate environment is created which is a must for the success of the model.

v) Application: The use of this model is more profitable for science subjects. The pupil learns to draw conclusions on the basis of information collected by him and its analysis. This model was developed for the natural sciences. But it is also used in literature for solving puzzling problems. Therefore, this model can be used to solve any problematic situation.

7.5.2 *Uses of Educational Media by a Teacher*

Effect of educational technology on teaching-learning situations has now been recognized to a great extent. These days principles of teaching are given more importance than the principles of learning. But the principles of teaching have not been clearly defined so far. Some findings in teaching models have been with the help of the media. Educational technology is useful for the teacher in the classroom in the following

manner:

1. It provides a scientific basis to the teacher's work.
2. It suggests new methods and techniques to settle problems of pupils regarding individual differences.
3. It has made the use of T.V. tape-recorder, radio etc., possible for teachers as well as pupils. Education has become possible for the students located at distances.
4. It has brought to light methods like systems analysis which can be used by the teacher effectively.
5. It has opened the doors to discovery of new methods of classroom teaching and training.
6. It helps in understanding the nature of education.
7. It has made the teaching-learning process purposeful/useful/effective.
8. It has made possible the maximum use of available aids.
9. It increases the efficiency of the teacher.
10. It helps in bring about the desired changes in the behaviour of the pupil.
11. It makes use of memory level, understanding level and reflective level and thus helps the pupils to develop originality and creativity.
12. It provides opportunity to arrange for maximum number of pupils e.g. programmed learning and learning through correspondence.
13. It helps the teacher to do research work in various fields.
14. Hardware approach to educational technology helps in storing original thoughts of scholars. A teacher can benefit from such a store-house of knowledge at any time.
15. It helps the teacher in specialization.
16. It saves the time of the teacher.
17. It gives an opportunity to the teacher to show his abilities.
18. It helps in simplifying the teaching process for the teacher.
19. It makes possible dynamic development in the teacher.
20. It helps the teacher in playing the role of an organizer, a director and an adviser.

For better comprehension, please read given below material.

Unesco (1981)	A Systems approach to teaching and learning procedures: A guide for educators. 2nd ed, France, the Unesco Press. PP.65-121	7-4

7.6 MEDIA AND EFFECTIVE TEACHING

Selection of media for distance education should be made on the basis of their effectiveness to serve at a reasonable price in a specific socio-economic and cultural situation. Some media would be ideal for individualized instruction, while others will provide mass communication approach. Printed materials, slides, transparencies and audio cassettes do not require expensive and elaborate studies, settings, editing facifities, sound proofing and air conditioning, imported equipment and technical expertise. Rather they are tailor-made for specific groups with little outside help. A variety of both conventional and technology based audio-visual aids will help distance education. No one aid can be recommended for all types of learning and learners. Technological aids of the inexpensive variety that are easily available, easy to prepare, easy to use and store and which bring about the greatest clarity in learning, will have to be given priority. A judicious mixture of indigenous and sophisticated media can serve the instructional purpose of distance education.

Distance institutes in our country may not be in a position to make use of all the innovations of modern communication technology but they should chalk out a phased programme for the integration of these devices into their teaching-learning system to make it more comprehensive. In the first instance, they should take immediate steps to adopt such devices as are easily available and within the reach of the learners. Radio, television, telephone, audio cassettes and video tapes should be made use of.

The International Conference on Distance Education made the following recommendations regarding the use of media in this specialized field.

i) To achieve the objective of mass instruction through distance education systems, use of media is necessary. It has been realized that the media cannot eliminate/replace the teacher. As such the media should not be seen as a threat to the traditional teacher.

ii) To ensure optimum utilization of mass media, instruction should be through the regional language, and not in English, because, if we want to educate the entire population, the medium of instruction is more important than the media used. The socially relevant subjects such as seed sowing, house nursing, photography, etc, can effectively be taught in the local language with the help of audio-visual media.

In our enthusiasm for the media, we should not forget to include socially relevant courses for the learners.

It has been accepted that the media should not be considered as a solution to all the educational problems. Their use has its own limitations depending on

use in different socio-cultural situations. The media should be introduced and used without losing sight of the social background of both the teachers and the learners.

For example, the emphasis should be given to 'contact programme'. As media may not be available to the entire population of the country, contact programmes may be useful to reach the rural population also, because our traditional ways of life cause resistance to audio-visual programme.

Media can play a major role in making education a possible reality for a large number of both illiterate and literate masses in the far flung interior villages as well as in the urban areas of the country.

Media can help adapt education to complex individual needs and conditions. Coverage of students of wide range of educational and social backgrounds and ages, aspirations, learning styles, environments and convenience under distance education takes the use of media very crucial. Media can help in improving the quality of education at a comparative lower cost than the formal system.

The development of electronic media has played a very vital role in the emergence of distance education system. New channels of communication have replaced the conventional or traditional channel of oral communication. In many developed countries of the world, it has been possible to open up TV channels for the transmission of educational programme throughout the day. Electronic media has made distance education dynamic and exciting.

In order to comprehend the concept of media and effective teaching in Planning and Producing of Instructional Material, please read the below referred material.

Kulkarni, S.S. (1989)	Introduction to Educational Technology: A system Approach to Micro Level Education, New Delhi, Oxford & IBH Publishing Co. PP.141-154	7-5

7.7 PRODUCTION OF INSTRUCTIONAL MATERIAL

Self instructional material is specially written for individuals to learn by themselves, without any assistance from another person. Generally programmed learning materials are considered as self instructional material. Self-instructional

material may take several forms. All such materials have some common characteristics. The following are some of them:

1. Reading materials are presented in smaller units to enable the learner to understand concepts or acquire information step by step.
2. After every presentation of a meaningful unit of information or development of a concept, an opportunity is provided to the learner to get feed-back on his understanding or learning. Proceeding to the next step depends on his learning the present one.
3. Since users of self-instructional materials do not have an opportunity to inter-act with a trainer and have to depend entirely on what is given to them, a good deal of time and effort is spent on the preparation of these materials. The materials are prepared according to the principles of programmed instruction and they are tested before final release of the material.
4. Since self-instructional materials depend entirely on the learner's motivation to learn, he has the freedom to work at his own pace.
5. Like in all forms of reading material the learner has to be active. At every step he needs to give responses to test himself and his learning.
6. In self-instructional material the assumptions about the entry behavior and objectives of the material in the form of terminal behaviour are explicity stated in the beginning.

Preparation of self-instructional material is a time consuming process. It requires good knowledge of the subject matter and skills of developing programmed instruction. Development of programmed instruction itself requires specialized skills. In some countries special courses of three to six months duration are being conducted to train programme writers. However, such skills can be developed in courses of shorter periods. The following steps are involved in preparing self-instructional material:

a) Select the subject on which self-instructional material needs to be prepared.
b) Explicity state the assumptions about the learner who is likely to use the material. This statement is in the form of entry behaviour. It should specify the knowledge, attitudes, skills, etc., that the learner possesses before going through the material.
c) State the objectives of the material in the form of terminal behaviour. Such objectives should indicate what the learner would be doing after completing the programme, under what conditions he would be doing it, and what are the minimum acceptable levels of performance.
d) Search the content matter that would go into the self-instructional material to develop the terminal behaviour in the learner. If no content matter is available it should be written in a way that the least a broad outline is be

developed, indicating what concepts and information the learner should get.

e) Decide the programming strategy, i.e., the style of programming (linear, branching, passage-type, not strictly programmed-instruction based etc.).

f) Arrange the subject-matter in a sequence, starting from simple to complex. Some material may need to be covered before the others.

g) Construct frames, passages or units of presentation of the contents or items. These follow the programming style. If linear programming is used and Skinner's style is followed, small units of information should be presented giving opportunity for the learner to test himself at every level. Difficult levels should be graduated for the frames and prompts should be provided.

h) Construct at the end of each meaningful unit of subject-matter criterion tests or unit tests to help the learner test himself and get feedback on his learning.

i) Test the materials individually or in small groups on a small sample of subjects. Observe their response patterns, difficulties and take their comments.

j) Evaluate and revise the self-instructional material.

One of the crucial sub-systems is the production of self-instructional material. The academic credibility of distance teaching institutions can be greatly enhanced if the instructional material is of a reasonably good quality. It should not be a pale copy of a textbook. In order to motivate distance learners, self-instructional material should be such that it initiates and sustains the learner's interest and helps him to evaluate his own performance. Self instructional material should have learner-based sequencing, clarity of presentation, adequate illustrations and compact organization.

Self-instructional material is different from a textbook. The purpose of the textbook is to 'present' the material. Self-instructional material, on the other hand, not only presents material but also 'teaches' students. In fact, self-instructional material is a 'teacher in print'. It is self-instructional because it teaches.

Self-instructional material is also self-contained because it undertakes the storage and retrieval functions of a textbook. All the learning content is presented to the learner at one place in most of the cases, and the learner is not required to oscillate from one source to another.

At the outset it is essential to be clear about the meaning of a course. From a narrow view, a course means study materials such as printed texts, audio-

visual tapes and other materials which enable the student to equip himself for final evaluation. From a broad perspective, a course can be considered a process of intellectual interaction of students and tutors and course teams based on the course material produced at the university.

Wragg, E.C. (1974) has given broad perspective of a course: "I believe we should begin from the assumption that course materials are not the course; rather that the course is an annual process of interaction between students, the materials, and the tutors, and that, in this sense, tutors, and students 'produce' courses as well as course teams." Thus from a broad point of view a course is a means of intellectual interaction of students, tutors and course teams based on the course materials produced.

In Pakistan, the term 'course' is often used for the overall programme of study consisting of several 'papers' taught or studied during the fixed number of years. A course in British and American universities is equivalent to a paper in Pakistani universities. The course production process in the system of Distance Education is as under:

After getting approval from the statutory bodies of the university, the course writing process starts. The course co-ordinator normally co-ordinates between the internal, external writers, the editor, designer and of course the course production bureau of the university.

The manuscript of a course is sent to the Bureau of Course Production by the department concerned. It is the responsibility of the Bureau to complete the editorial and designing work within the stipulated time. The manuscript of the course is sent to the course coordinator before sending it to the Production Manager for the purpose of printing. The Course Co-ordinator checks the manuscript and corrects it according to the suggestions of the Editor. Then he sends the manuscript to the Course Production Manager through the Course Production Bureau.

The Production Manager is concerned with format, layout, types of illustrations, pagination, type style, selection of stock, text bulk, method of printing, type of binding, scheduling, and the finished product. He also knows his printers and their capabilities. Finally, he should know how to specify production jobs to potential printers so that they can give him suitable and relevant bids.

To follow through a printing job from the time the manuscript is handed over to the Production Manager, it is best to look at each of the following steps in the course production process.

A. Format of texts, lessons and study guides, as well as formats of special jobs, are most often determined and agreed upon by the university educational staff and editorial staff. Thus, the Production manager is aware of what the finished text should look like in terms of size, cover binding and overall design.

B. The Production Manager normally selects the type faces, and decides which style and size of type to use. He also considers the size of the main headings, sub-headings, and the text material itself, as well as the legends for illustrations. It is the responsibility of the Production Manager to consult the printer in order to know what fonts he has on hand. If a typeface is specified and the printer does not have that particular font, the Production Manager can ask the printer to obtain that type font. Because it is expensive, it is frequently preferable to use a typeface already available. Once these decisions are made, the manuscript is normally proof read. After this, the manuscript is ready to go to the printer.

C. Sometimes the printing is done in-house. Not only that, but with the growing interest in and use of desktop publishing, a new dimension has been added to the course production process. Anyhow, whether the printing of the course is with the printer or in-house, it is the responsibility of the Production Manager to pursue the printing process. By doing so, he will be able to get acceptable work at the best possible price. This is not to say that the lowest price is always selected; quality and delivery schedule must meet the university's need of which the Production Manager should be careful.

However, before handing over the manuscript to the printer, the Production Manager must ensure the following check-list:

1. What typeface will be used?
2. How many colours of printing will be required?
3. What colour paper will be used?
4. How will the covers and packaging be designed?
5. How the self-assessment questions and activities will be highlighted?
6. Will space be left for students to the write their answers to self-assessment questions and activities?
7. What width will the margins have?
8. What paper size and shape will be used?
9. How many words per page are recommended?
10. How will the unit headings be presented?
11. What style of illustration will be used?
12. What will be the quality and weight of the paper?
13. What type fonts for all parts of the publication, including front matter,

running heads, references, headings, tables, etc, will be used?

14. What type or imposition size, such as the length of the lines and the number of lines on each page will be used?
15. Required styles for reference lists and bibliographies.
16. Style for indexes.
17. Placement of page numbers.
18. Finally, symbols to be used to identify footnotes or references.

Once the above mentioned specifications have been agreed, specimen pages can be prepared showing all the details, the manuscript is then sent for printing.

After selection of the printer, the Production Manager normally sends him the manuscript on the agreed upon production process. In case of in-house printing, the manuscript is sent to the Print Production Unit of the university. However, the word printer is used both for the outside printer and Print Production Unit. The responsibilities of both the printers (external or in-house) are the same.

After a few days the printer returns the manuscript to the Production Manager alongwith galley proofs of the type-set material. The Production Manager examines the proof sheets to make sure that the text has been completely type-set. Then the galleys and manuscript are returned to the Course Coordinator for proof reading and checking of the material.

The Course Co-ordinator returns the galleys duly proof read to the Production Manger. If there are many corrections, which there should not be, it may be necessary to send the galleys back to the printer to make the corrections. If this happens, corrected galleys are required to repeat the same process of proof reading by the Course Co-ordinator.

When the galleys are satisfactory, the Production Manager will commence paging the book. He will cut the galleys and fit the type to the predetermined format. Illustrations, tables and other graphics must be considered and allotted the proper amount of space.

Here please note that the Production Manager has print production staff to look after all the activities under his supervision. Staff do all the activities in coordination with the Course Co-ordinator to ensure that the illustrations are in the best possible proximity to the text material which they refer to. In case of any dispute, the Course Editor will make the final decision of the placement of illustrations.

Care is taken in sending the illustrations, including artwork, photographs, tabular material and the like, to the printer for reproduction. Line drawings should be precise. Glossy photos should be furnished. Illustrations to be shown in half-tones should be prepared so they show exactly what is desired. In case different colour illustrations are desired, good clear photos should be furnished. The desired size of the illustrations must be clearly specified. Particularly in four-colour work, colour separation must be done to a predetermined size, since photographic reduction is not possible once the separations are completed. Tabular material should be laid out carefully and precise instructions given to the printer as to how such tables are to be set. The printer can vary the size of the finished printing in line drawings on the direction of the Production Manager. Graphs should also be supplied in best finished conditions, so that they can be produced photographically. You can easily see from the above mentioned cases that an artistic ability is needed to ensure a desirable quality of illustrations.

Moreover, it is important to remember that the legends, figure numbers, and the like, must be placed in the correct position so that such graphics are identified. It may seem too elementary to mention that the odd-numbered pages are always on the right, while even-numbered pages are on the left. A right hand page is called a recto; a left hand page is called verso.

Coming to the printer again. He will make any noted corrections and will set up the pages as indicated by the Production Manager. If necessary, he will produce a page proof, which shows exactly how the finished work will look like without the illustrations. However, the locations where illustrations are to be placed will be blank. Page proofs are examined by the Production Manager. This is the last chance to make copy changes without incurring enormous expenses. Sometimes, the Production Manager may opt to eliminate this step and go directly to a 'blueline'. This is not usually a good practice.

The 'blueline' is a true copy of the finished book, except that everything is shown in single colour, most often blue. Illustrations are placed, pagination completed and pages are numbered. The index, if any, carries the proper page references. Whether a page proof is seen or not, the blueline is the very last chance to make any changes before production. A word of warning here that changes on the blueline are quite expensive. Therefore, everything should be ready to go.

For further details, please glance through the below mentioned materials.

Dorothy Anderson (1989)	A Guide to Information Sources for the Preparation, Editing and Production of Documents, Sydney, Gower, PP. 73-101	7-6

7.8 ACTIVITIES

1. Draw a diagram of educational objectives alongwith suitable media to be used for achieving the objectives.

2. Discuss with any educationist of your area the curriculum contents and media and prepare a report of the outcome of your discussion.

3. List below the teaching strategies and possible media for making the teaching learning process effective:

   _____

   _____

   _____

4. Make a chart of using media for effective teaching.

5. Draw a diagram indicating the process of instructional material production.

7.9 EXERCISE

Hopefully you have studied the unit. Now please answer the following questions:

Q.No.1 Critically examine the role of educational objectives and media in planning and producing of instructional materials.

Q.No.2 Explain the curriculum content and the relevant media for producing of instructional materials.

Q.N0.3 Discuss teaching strategies/models and media to be used in teaching instruction.

Q.No.4 Which of the teaching strategies is effectively used in the Pakistani schools? Discuss with reference to advantages and disadvantages of the said strategy.

Q.No.5 Discuss the important models of teaching.

Q.No.6 Write a short note on the following:

1. The concept attaining model/strategy.
2. Inquiry training strategy.
3. Uses of educational media by a teacher.

Q.No.7 Critically examine the role of media in effective teaching.

Q.No.8 Discuss the classification of media according to the senses they stimulate.

Q.No.9 Critically examine the role of the teacher as presenter of information for multi-media package.

Q.No.10 Discuss the production process of instructional materials.

Q.No.11 What measures are required for an efficient production process? Discuss in detail.

Q.No.12 How can production process of instructional material be made more effective and efficient? Discuss.

7.10 BIBLIOGRAPHY

1. Bruce Joyce and Marsha Weil with Beverly Showers (1992) — Models of Teaching, 4th. ed. Prentice-Hall of India Private Limited

2. Daniel Linden Duke (1990) — Teaching: An Introduction, New York, McGraw-Hill Publishing Company.

3. Dorothy Anderson (1989) — A Guide to Information Sources for the Preparation, Editing and Production of Documents, Sydney, Gower.

4. Kulkarni, S.S. (1989) — Introduction to Educational Technology, New Delhi, Oxford & IBM Publishing Co.

5. Noel Entwistle (1988) — Styles of Learning and Teaching, London, David Fulton Publishers.

6. Unesco (1981) — A Systems approach to teaching and learning procedures: A guide for educators, 2nd ed, France, the Unesco Press.

7. Wragg, E.C. (1974) — Teaching Teaching, London, David & Charles.

Unit No.8

ORGANIZATION AND MANAGEMENT OF EDUCATIONAL MEDIA

By
Dr. Muhammad Rashid

8.1 INTRODUCTION

The central economic question of the time is why some countries develop faster than others. For practical reasons, it is an urgent question to answer. Few persons with recent experience of the developing countries doubt the need for their social and economic development. They know that expanding education is a vital part of such development

Economist have been increasingly aware of the relation between education and growth. Literacy levels, school and university enrolments are now commonly used as statistical measures of development. In developed countries, it is clear that increased productivity has resulted from not only an expansion of the labour force and physical capital, but also greater education and training. In such countries, development demands infrastructure, in particular an educated and enterprising labour force. This interest in education is not entirely new. The importance of the quality of the labour force was also realized by the classical economists and they had spotted the link between education and wages. What is new is the qualitative nature of modern studies, using better data in more sophisticated ways.

But there is still a gap between the issues of educational planning which pre-occupy economists and the economic problems that confront ministry of education in most countries. Economists have emphasized the need for quantification and for valuing the benefits of education, and they have recently developed new techniques to do this. However, in their view, officials in the ministry often have a restricted view of the economic problems of educational expansion, and, in many cases, the problem of getting finance to meet ever rising expenditures. There is a need to explore other economic aspects of educational planning.

All the same, qualitative planning is no substitute for the brilliant teacher. In many ways though, the quantitative and qualitative aspects of education are independent. It is only by a quantitative manpower approach that a nation can make its choices clear, such as how many students it should send to university; in which year every person will know how to read and what must be sacrificed to make this possible.

Planners must be aware of the methods used for instructional purposes. Lecture, lecture demonstration, individual practical work in the laboratory/workshop, field trip and planning and completion of projects are generally the methods of instruction. The policy makers and planners must have a clear picture in their mind in respect of educational media. It is important to mention here that varied activity will prevent boredom and use of multi-media is necessary on many occasions to make pupils fully understand the particular

subject. Use of teaching aids becomes a necessity whatever method is adopted. The teaching aids vary in nature and complexity, from the simple but necessary and effective chalkboard diagram to the close circuit television. The right type of aid should be used in the right way at the right time. And, of course, first of all it is necessary to possess the required aids, and suitable facilities should be there to make use of the available aids.

Some aids can be improvised. Some aids can be easily fabricated, which it may be necessary to purchase others. In order to use teaching aids in the classroom, proper planning is essential. For different subjects areas, different teaching materials are required. What sort of materials and tools will be needed for the preparation of teaching aids, must be identified at the planning stage. The organization of hardware and software is necessary in any planning for education.

The policy makers must be aware of the role that educational media can play in organization management. The required equipments, techniques and facilities in organization of support service is to be kept in mind while planning any educational programme.

8.2 OBJECTIVES

After studying the unit, it is hoped that the student will be able to;

1. explain the organization and management process of educational media.
2. differentiate between expensive and in-expensive materials.
3. discuss the role of the teacher in the proper using of the media.
4. explain the problems and measures for procurement of materials.
5. identify the sources for procurement of materials, respectively at the local, provincial, national, and international levels.
6. evaluate the role of a media resource centre.

8.3 BROAD CLASSIFICATION OF MATERIALS

Technologies have encouraged the emergence of many new teaching devices. Many of these devices appear with such rapidity that the classroom teacher is barely able to become familiar with one before another is introduced. Technology has become so much a part of contemporary man and his educational surroundings that it is difficult to imagine either teaching or learning without its aid. The classical educator did not have the same familiar experiences with technology.

Technological changes in education can be divided into three categories. First, a rapid steady growth of the use of audio-visual aids in classrooms. These include films, tapes, television, records, filmstrips, slides, and photographs. The uses of these diverse aids are two-fold: to impart information and to provoke thought. A second category involves programmed material. The principal aim of this activity is to train the student in a skill or to impart to him a fixed body of knowledge for later use. A third category involves computer hook-ups to centralized data banks that permit a student to secure information about any larger question, however complex, that he is trying to solve. The aim here is to reduce the amount of tedious legwork so that the students can have more time for other explorations. It also serves to widen the horizons of students. Assuming that the data bank includes a universe of information and does no editing on its own, use of this kind of device results in a very limited amount of subliminal implications. It is possible, except for the substantial subliminal effects in the audio-visual technology, to design the devices so that they are nothing but helpers in the normal ways of doing things.

Leaving aside the discussion on the significant use of technological devices in the classroom situation, if we classify the media we find "hardware and software" approach to technology. Technologists view the hardware approach as important in stressing the origin and application of teaching machines to education and educational training systems. However, controversy over this view dominates the literature of educational technology. The software approach refers primarily to shaping behaviour through programmes associated with the technological model such as programmed learning task analysis, systematic education and objectives. There are two types of material expensive and inexpensive:

Expensive: All electronic aids such as video, T.V., teleconferencing, cable television, satellite television, computer networking and internet, audio-video, language laboratories, films, and film strips come under the category of expensive media. Some other media as mentioned in Unit No.5 and Unit No.9 are also expensive media.

Inexpensive:- Other materials such as textbooks, magazines, duplicated written material, pictures, maps, posters, charts, cartoons, comics, models, diagram, graphs, globe, various types of boards and locally available teaching supporting instruments, all comes in the category of inexpensive media.

For further details, please read the below referred materials.

Unesco (1974)	New Trends in the Utilization of Educational Technology for Science Education, Paris, The Unesco Press. PP.130-138	8-1

8.4 PROBLEMS IN PROCUREMENT OF MATERIAL

When a teacher uses teaching aids he needs more planning and preparation than when he only talks, but his additional labour is always rewarded with more effective learning on the part of his audience. An aid must make the viewer to eye teacher s ideas, and try his ideas. It should be borne in mind that aids are not instructional in themselves. They are no substitute for the teacher. In reality these materials only help the instructor. Audio-visual instruction is not a substitutive educational device, and is also not mere entertainment. In short, these A.V. aids are supplementary devices by which the teacher, through the utilization of more than one sensory channel, helps to clarify and correlate accurate concepts, interpretations and appreciations.

No doubt, to a certain degree each aid has its own relative importance, but to a greater extent the usefulness of an aid would rest on the personality of the teacher. The more keen teacher will impart knowledge in a more understandable way. His aim should always be to find ways to make his teaching more effective, and aids are the means to achieve it. The following points, can help a willing teacher to select and use a teaching aid/materials to greater effect.

1. Select the best aid, or combination of aids, to meet specific objectives.
2. The aid should not be foreign to the learner's environment.
3. It should be appropriate to the learner's age, intelligence and sex.
4. The aid should not be too old or damaged.
5. Too many aids should not be used unnecessarily.
6. Simple aids, if equally effective, should be preferred to expensive ones.
7. An aid should help learners to make better thinkers and critical-minded.
8. An aid should help to improve human relations.
9. The selected aid should be worth the time, expense and efforts involved.
10. A teacher should know his own capabilities while making selection.

Through the intelligent use of words, recordings, pictures, drawings, films, photographs, models, exhibits, posters, etc, one can convey the required word to the learning situation.

8.4.1 *Problems and Principles for Organizing Strong Service Programmes.*

A view of representative though generalized listings of the teacher's duties should focus on the broad working principles upon which the duties and decision connected with them are based. For it is only on the basis of sound theory that sound decisions can be made. At the risk of oversimplification the author states his version of what he believes to be sound working principles for setting up an effective service programme. Such principles are usefully not followed properly. Those that must be followed include the following:-

1. The best guarantee of success for the audio-visual service programme is the placing of full responsibility for its operation upon a qualified leader who will work on a coordinate basis with other curriculum personnel. Also imperative is the provision of the necessary financial support for auxiliary staff, equipment, materials and facilities. This principle demands that school system officials commit themselves publicly to plan for positive action.
2. Audio-visual materials should easily be accessible to teachers at the time they are needed. This principle demands that generous help be available to teachers in selecting materials from local as well as sources outside the school system. The catalogues of subjects or unit-correlated lists of materials should be made up for the teacher's use and simple convenient systems for ordering, delivery, and pickup be devised so that materials used frequently by a number of teachers should be purchased and made a part of an expanding audio-visual service centre library. This principle also demands that teachers be able to select their own materials. Hence, help must be given in facilitating pre-use or pre-purchase inspection.
3. Audio-visual equipment should be made available to teachers with a minimum of inconvenience and distraction. This principle demands that each school building be equipped with necessary audio-visual equipment units to meet the needs of the curriculum. Eventually all classrooms be provided with necessary light-control systems and suitably located electrical outlets for picture-projection systems. This principle also seems to demand that sources of assistance for equipment ordering, handling and use be located as close as is feasible to the teacher.
4. To overcome the shortage of materials, the audio-visual service programme should include a variety of materials for teachers. This principle demands that many kinds of instructional materials be made available to teachers, including materials for production, maps and globes, library books and textbooks. Wherever administratively feasible, the assistance be given by coordinating school community relationships of all kinds, thus making possible field trips, resource persons, interviews, a library of community documents, and cooperation between schools and local radio/television stations.
5. The problem of untrained manpower can be overcome by providing audio-visual service training programme for the continuous, effective in-service growth of teachers in accordance with their needs. This principle demands that teachers be given

ample opportunity to develop competence in the use of a wide variety of teaching tools. The participation of teachers in planning for their significant growth-building activities be sought. Such a programme has tremendous implications on many fronts for the betterment of the teaching staff, in addition to the up-grading of specific competencies with audio-visual materials.

6. Provision for city-wide audio-visual services need to be based upon continuous long-term planning. This principle demands that any plan of action must be convened as a long-term project. Continuing financial support must be provided to meet curriculum needs. The process of providing building facilities must be carried on as part of a master plan for all the schools. This principle applies to the in-service growth of teachers as well.

The broad principles for setting up or procurement of the audio-visual service programme just described may, if known by higher authority in time, lead to a better basis for thinking and action that will ensure the success of a new venture.

8.4.2 *Responsibilities of Teacher*

The newly appointed teacher of the audio-visual service programme may report for his or her first day as a stranger, or, as is frequently the case, he may already have been a well-known and respected local staff member. He may, of course, begin to operate according to an administrative operational plan that represents careful operative effort of a local study committee. He may be fortunate enough to have immediate access to a local school-system, survey of equipment, classroom facilities, professional status of teachers, and well-worked-out catalogue and distribution procedures. He may even find an advisory council and a school building coordinators group waiting for a first bulletin or the resumption of a series of meetings. He may even walk into a well-equipped audio-visual centre with secretarial and technical staff at work on routine business. He may even be called upon during the first hour on his new job, to collect evidence and make a decision about printing, production, or projectors. He just may have to start from scratch. Is there a safe and sure formula? The answer must be "no".

The primary purpose is to make the teacher define problems in this field and to discover sound solutions for them in terms of a unique environment. As to initiating a programme, the following good advice merits careful consideration:

1. Find out what positive and negative influences are at work.

2. Be friendly, sincere, modest, objective, and industrious.
3. Get the facts about school materials, equipment, and facilities at once.
4. Make personal commitments only for services that can be met on time.
5. Enlist the cooperation of colleagues to give the work of the organization a good start.
6. Give attention to the proper pacing of activities and work loads.
7. Define problems and assign priorities for solution.
8. Get to know colleagues at all levels.
9. Make an operational plan for the higher authority, if one does not already exist.
10. Identify some impartial, nearby sources of advice.

8.4.3 *Defining Problems and Goals*

It is doubtless true that there will never be enough time or staff in any one locality to carry out adequately all the proposed duties of a teacher of audio-visual services. In fact the selection of targets for energy and action in terms of outstanding needs is a very significant problem in itself. It is urgent, therefore, in the economy of time and effort to define specific local problems and to mark out as clearly as possible the goals that are to be achieved. It is not sufficient to make a listing of general duties. The teacher must define in terms of his own situation what level of competence in students he will seek to develop and how comprehensive his programme of service must be, and then plan for a five or ten-year effort. A list of conditions would not suffice. The teacher will also have to set his foot into every classroom, or organize others to do it, to map out a facilities and equipment programme, and then set up a long-range plan to achieve it.

The teacher's attitude of criticalness and his desire to mobilize the facts go hand in hand with his drive to define problems and set up objectives. And of course not the least of his problems will be to get his colleagues to set up their own objectives for improved action in the area of his concern. Evidence may lead to the defining of a need, and then how to meet it becomes the problem, and this of course may call for another set of data.

8.4.4 *Self-Teaching of new Skills*

Most individuals have reserves of energy, stamina, and creative capacity that have never been tapped. These reserves of power have been called forth in thousands of individuals by the free enterprise system of Pakistan

in a gigantic how-to-do-it sales campaign. From making a Polaroid camera transparency to building one's own home seems for some to be but a short step.

In the audio-visual service business, the need for a love of learning new skills becomes an essential for success. However, instruction sheets, diagrams, and complete kits make this a game. Out of a weekend of leisure time, a few supplies, some simple equipment, some careful reading, some trial and error responses, for example, may contribute to a teacher's first transparencies for a meeting two months away, or to a script for a film, a scale drawing of a new audio-visual centre, or a new handbook for bulletin board display.

Outstanding performance by teachers of audio-visual education demands the self-teaching of new skills, and a love of learning will make this process both enjoyable and successful. It will take courage, effort, and stamina, but fortunately these are in our heritage. Furthermore, if he does not know it already, the teacher should learn that not all the needed professional skills have to be acquired in formal courses for university credit. The teacher will naturally identify needed operational skills as problems arise in his day-to-day work, and instead of delaying action until the right course may be found, he should try to locate appropriate reference material and direction sheets, obtain needed equipment, and then engage in study and practice. To speed up the process, he should obtain the usually available help from friends, specialists, tradesmen, manufacturers, salesmen, and other hobbyists.

With this brief treatment of several desirable personal attributes, the writer now turns to the remaining essentials for expert performance, which, because of their pervasive and complex nature, and their implications for action, must be analysed more carefully. The following extensive discussion, though all too limited, suggests that the performance of the audio-visual specialist is more likely be of outstanding calibre if his thinking is guided by (1) a correct view of teaching and learning, (2) an understanding of the roles that audio-visual materials play, and by (3) a well-developed system of basic utilization principles.

8.4.5 *A correct view of Teaching and Learning*

Wherever there is loose thinking, real progress is impeded. Every one's opinion about education is not as good as that of the next man. A great deal is known today about teaching and learning, yet many educators remain confused. The teacher of audio-visual services must avoid such

confusion through a systematic effort to develop a set of working principles, a set of policies for action. He ought to arrive at valid definitions and ought to decide on a current framework of reference.

The audio-visual specialist will usually find himself in the midst of a wide variety of opportunities for learning from the most talented teachers, supervisors and leaders. He must strengthen his own theoretical outlook by constant study. The teacher should not be "taken in" by colleagues who denounce theory in favour of practice, for if he is to be a practical man, he must be a master of theory.

A correct view of teaching and learning must not be divorced from the teacher's primary relationship with instructional processes. In meeting this obligation, he should not only view the teaching process from the focal point of how it is done; he needs also to keep in sharp focus the broader view of what is being selected for teaching. The teacher must, therefore, realize that he is, or ought to prepare himself to be, a valuable member of the curriculum improvement team on the one hand, and a capable implementor, facilitator, and helper in day-to-day classroom processes on the other. In exerting effort to develop valid points of view for making good decisions, it will be helpful for the teacher to consider the following discussions: (1) curriculum designs and the use of audio-visual materials, (2) basic principles of teaching and learning, and (3) effective implementation.

The teacher needs to be familiar with fundamental curriculum designs that have been proposed in terms of changing cultural values, and he should be aware of the fact that the curriculum in any given school community is likely to be a unique mixture of such designs with audio-visual and other instructional materials making a variety of contributions.

Inspection will show that curriculum designs, as they are presently operating in schools, are similar in some respects and widely different in others, but all need appropriate instructional materials, the best possible teachers, capable leadership and financial support for audio-visual methods if they are to be effectively implemented. Each locally adopted curriculum pattern will be certain to emphasize characteristic values.

The way in which facts, generalizations, and skills are organized for teaching, with emphasis upon particular values, has a definite bearing on the way audio-visual materials are selected and put to work. However, as has been previously pointed out, regardless of the curriculum design

prevalent in any given community, audio-visual materials will make significant contributions to learning and teaching. In the most traditional subject-type curricula, good teachers will feel the need for a wide range of audio-visual materials to present clear explanations and to develop readiness in pupils for new subject matter areas by defining issues and developing interest in prescribed activities. Audio-visual materials will also assist in presenting practical applications of content to everyday situations, as well as aiding in evaluation, diagnostic, and remedial work. To be sure, selection will be by the teacher, and emphasis may in some cases be upon memorization. But as curriculum patterns move away from subject designs to the psychological organization of learning activity, audio-visual materials are used in relation to the purposes of pupils--that is, used in helping to solve problems that they themselves have defined, selected, and cooperatively planned. In this framework of reference, pupil concerns will determine both the nature and the quantity of materials needed. Certainly the teacher will be the guide in suggesting helpful items and will have to locate valid materials as needs for them become obvious or are anticipated. Also, in cases where preplanning for the year cannot be done, scheduling of materials long in advance, as is common in cases where sequential units of work are taught repeatedly, cannot be practised. It is readily seen that under such curriculum designs, materials that are produced to serve in the capacity of realistic vicarious experiences, or are produced on topics that deal with pupils' life situations, will be of special significance.

This statement of suggested ways in which audio-visual materials will facilitate learning under the various curriculum patterns, is not intended to be complete, since, as has been pointed out, a broad understanding of the roles they play is essential for expert performance. Hence it will be given a separate treatment, and guidance for the development of a correct view of teaching and learning now turns from curriculum designs to a discussion of basic educational principles.

The following discussion has been included, in order to assist the teacher to establish a framework of reference for thinking about the use of audio-visual materials. In the preceding paras attention was focused on the selection of content and its organization. Hence, the emphasis will now primarily be on how teaching can be in accordance with established general principles. The teacher who understands these principles will have as his orientation for action the most dependable professional learning about how to teach.

8.4.6 *Obtaining Financial Support*

It is the responsibility of the teacher, for a penetrating analysis of needs and the vigorous pursuit of adequate financial support, to meet those needs. This is a complex responsibility because it involves the matter of balance. Schools need many service agencies, higher salaries, and ample supplies, and into this web of local circumstances the teacher must direct his steps to request and obtain the needed support in optimum amount for the good of all concerned. To be sure, he need not stand alone in making such requests, because allotments for his services are spread out over the entire instructional programme. Thus the school principal, teachers, and other curriculum specialists can be of real help in substantiating and formulating the requests to be submitted. Special budget-preparation study groups and the teacher's advisory committee, if he has one, ought to make significant contribution to the formulation of sound recommendations.

Keeping needs, goals, and costs in mind: Knowing what needs have to be met, having definite operational goals in mind, and having a long-term plan formulated, as was indicated in the example of cost determination, are the first and foremost bases of success. Having tabulated data in terms of operational needs, and having a cost-analysis plan at hand carry the authority of facts. Long-term planning is possible only when the facts are at hand and recognized everywhere as good business, and the recognition of prudent management is sure to build up the teachers's reputation in the public view. Guessing and predicting what would be good to do with the money if it were provided, is the other alternative, and everyone knows this is not good common sense.

Minimum standards information is useful: In preparing long-term development plans, and in presenting information to administrative officials and the public, authoritative statements representing national thinking are useful. Local considerations of equipment needs, size, number and location of buildings, and curriculum needs, must be the final determinants of the desired status.

Apart from the above mentioned discussion, it is necessary to highlight the sources of availability which a teacher or the administrator can arrange for the procurement of materials.

Local level: At this level, the teacher should make efforts to utilize the locally available materials for making the teaching-learning process more effective. He should use the local example while teaching the class. He should be careful in quoting examples because if the students are not

familiar with the things mentioned by the teacher the desired result would not be achieved.

At the local level the teacher should take help of head of the area, head of district or tehsil for assistance in making the teaching-learning process effective. He should use locally available teaching aids in the classroom.

Provincial level: At provincial level, the teacher must send his requirement through proper channel to the Secretary of Education, Chief Minister or Governor of the concerned province for sufficient funds. He should make a proposal for the supply of suitable materials such as reference books, A.V.Aids, and latest electronic equipment which can easily be used in the classroom.

Through financial assistance at provincial level, the problems such as school buildings, supply of trained manpower and other means of effective communication in the classroom can be overcome.

National level: At the national level the support can be achieved through the Federal Ministry of Education in making the teaching-learning process more effective. Special request to various agencies of national level can be made for financial assistance, trained manpower, staff development arrangements, and the introduction of innovative technologies in education.

For this purpose, the special request can be made to the Federal Government for financial assistance or in the shape of experts/consultants for in-service training of the teaching force of the country. Such consultants may organize training workshops throughout the country for up-gradation of the teachers, keeping them abreast with the latest curricula or developing in new curricula for the country.

International level: At international level efforts should be made to obtain the latest materials and equipments. In this regard donor agencies may also be contacted for assistance to make the education system of the country more productive, effective and efficient. The role of Unesco, UNDP, ADB, World Bank, OPEC-Fund, and ODA (British Council) is identical for the provision of consultancy, supply of latest equipments and to keep the country educationally at par with other countries of the region.

The international organizations and donor agencies must be

involved through Ministry of Education in making our teaching-learning process effective. Efforts should be made to organize more training workshops, seminars, conferences and study visits (abroad). This can only be possible if a reasonable proposal with full justification is presented to the Ministry of Education for exploring such type of assistance from the donor agencies or provide support through government sources.

For further details, concerning organizations at national level concerned with multi-media aids to education and multi-media resources centre, please read the below referred material.

Alan Hancock (1977)	Planning for Educational Mass Media, London, Longman. PP.64-116.	8-2
Norman, J Atkinson and John, N Atkinson (1975)	Modern Teaching Aids, 2nd ed. London, McDonald & Evans Ltd. PP.253-274	8-3

8.5 MEDIA RESOURCE CENTRE

The 'Resource Centre' is a place which enables the teachers and learners to secure appropriate materials and, if necessary, the required consultancy help. Garnett, E. (1970) has listed the following valuable points on the nature of area resource centre:

1. An area resource centre, in our view, differs radically from the other resource institutions with which it will liaise very closely. The important functions of such resource centres are to provide a managerial service. It needs to be adequately staffed.
2. The task of the area resource centre's precept and training sessions are to encourage a high professional standard, a real educational standard in resource making. The resource centres normally have different kinds of links with a large number of individuals and groups at work in its area on curriculum resources of one sort or another.
3. A resource centre must be the holder of certain specialized facilities and certainly consider itself a training centre. It must stand at the crossroads of information which can usefully be swapped between the teacher and the taught.

Anyhow, from the quotation mentioned above, it can be said that anything used to meet an educational need might be called a resource building, staff, equipment, ideas and material as these all are interrelated in practice. Particularly, this section of the unit is concerned chiefly with the information and materials required for teaching and learning. A wide range of resources available

nowadays enable the teachers to assume different roles within the course of instruction. The resource centres with their supporting equipment, can sometimes instruct more efficiently than the teachers. However, the resource needs for instruction that is still teacher-centered, are the professional skills of the teacher and materials in a form and medium which leave him dominant. The ability to read and tell a story well has been mentioned, as has the gift of inspiring ideas and commanding respect. The planning of a lesson in which many teachers were instructed in their professional training, still holds good. The familiar equipment of chalk and black board has now been supplemented by the white board and overhead projectors.

Three important resources can be given for the greater use of resource centres as the agent of instruction. Firstly, they do not keep the teachers presonality between the student and achievement, and indeed the teacher may not need to be present. Secondly, some media can be attractive and highly motivating; and thirdly, some materials allow students to proceed at their own pace. Instructional films, television programmes, filmstrips and slides with tape have proved to be very successful, when used selectively and with a clear purpose. Difficulties have most often been due to lack of preparation, inadequate facilities, poorly maintained equipment and some teacher's lack of expertise in using it. Moreover, instruction through audio-visual aids can have an added advantage for less able students for they need not face a constant succession of reading difficulties. Tape recordings have been found very valuable in meeting such problems in mixed ability groups.

Leaving aside the discussion relating to audio-visual equipment and their effective use in the teaching learning process available in the resource centres, these resource centres can play a vital role in teaching and learning. How do they play an effective role? What are the functions of a resource centre? How does their information and storage system look like? In order to find answers to these questions, please read the below mentioned reference.

Richard Fothergill, ed (1973)	Resource Centres in Colleges of Education, London, National Council for Educational Technology. PP.4-21	8-4

After reading the above referred material, you may be thinking on how to plan and organize a resource centre. For this purpose, you are advised to read the following material which will provide you good awareness on the topic.

Cecilia Gordon (1973)	Resource Organization in Primary Schools, London, National Council for Educational Technology with the school Library Association, PP.11-21	8-5

8.6 ACTIVITIES

1. Outline a diagram showing the broad classification of materials required in the organization and management of media.
2. Discuss the importance of resource centre with any educationist and prepare a report of the outcome of your discussion.
3. Prepare a list of materials which must be available in the resource centre.

8.9 EXERCISE

Q.No.1 Discuss the broad classification of materials.

Q.No.2 Critically examine the role of the teacher in using the audio-visual materials to make the teaching-learning process effective and efficient.

Q.No.3 Discuss the problems faced by the class teacher in getting suitable A.V. aids for instruction.

Q.No.4 Describe the care which a teacher should take, while selecting A.V. aids for effective teaching.

Q.No.5 What measures should the teacher adopt to organize a strong service programme? Discuss.

Q.No.6 Critically examine the responsibility of the teacher in procuring of materials.

Q.No.7 Write a short note on the following.

1. Defining problems and goals.
2. Self-teaching of new skills.
3. Correct view of teaching & learning.
4. Financial support for resource centre.

Q.No.8 Critically examine the role of resource centres in the teaching-learning process.

Q.No.9 Discuss the main characteristics of a resource centre.

Q.No.10 How do you plan a resource centre, especially in a primary schools? Explain.

8.10 BIBLIOGRAPHY

1. Alan Hancock (1977) — Planning for Educational Mass Media, London, Longman.

2. Cecilia Gordon (1973) — Resource Organization in Primary Schools, London, National Council for Educational Technology with the School Library Association.

3. Garnett Emmerline (1970) — The report by National Extension College on "After-School English" quoted in Edstrom L., Erdos, R, and Prosser (1970) Mass Education: Studies in Adult Education and Teaching Correspondence in some Developing Countries, Sweden, Almqvist and Boktrycheri.

4. John Hanson (1975) — The use of Resource Centre, London, George Allen & Unwin ltd.

5. Norman, J Atkinson and John, N Atkinson (1975) — Modern Teaching Aids, 2nd ed. London, McDonald & Evans Ltd.

6. Richard Fothergill, ed (1973) — Resource Centres in Colleges of Education, London, National Council for Educational Technology.

7. Unesco (1974) — New Trends in the Utilizationof Educational Technology for Science Education, Paris, The Unesco Press.

Unit - 9

NEW TRENDS IN EDUCATIONAL TECHNOLOGY.

By
Dr. Muhammad Rashid

9.1. INTRODUCTION.

The teaching technology that is currently used all over the country, and in most of the formal institutions, is lectures or face-to-face instruction, and printed material. The lecture system has been in vogue for centuries and it is still the most dominant. It is very effective where it is done by a good teacher. This technology has served the purpose of education for a long time, but it has its limitations. It lays emphasis on four characteristics: (a) teaching has to be done by the teacher; (b) it has to be done in the classroom; (c) consideration for age group; and (d) teaching has to be face-to-face. There are large sections of the people who are unable to satisfy these conditions, and, as a result, they do not have access to education. No wonder the spread of education has been limited in Pakistan and, despite criticism there has not been much progress.

What are the communication technologies which are available today in this world? It may be mentioned here that what is new to one country may be old for another. Modern, advance technologies are available only in advanced societies, but others are available in developing countries also. The most important of these technologies which has been used extensively during the last few decades in different parts of the world for educational purposes is radio. It is particularly useful to people living in remote and far-flung areas. A well prepared radio lesson can be an effective means of instruction. There are also radio conferences and tutorials. A good radio network can be of great assistance in promoting education. The second important technology is television, because its visual creates a great impact. It can be very effectively used for technology and science subjects where demonstrations are required. With the availability of satellite, the potential of teaching by TV has been vastly enhanced. However, in developing countries like Pakistan, television is not within the reach of the majority of the people. It is costly and very few students can afford to own a T.V. set. Another limitation of T.V. is that the broadcasting time may not suit many students. These deficiencies can be overcome if T.V. sets are made available to the educational institutions and community sets are provided in villages. Lessons can be repeated so that those who have missed can catch up at a different time.

Another technology that is gaining importance all over the world is the computer. Computer-aided instruction or learning is becoming increasingly popular. Popularly called CAI, it is likely to become even more popular in the years to come.

The material used on radio and television can be supplied in the form of audio and video cassettes to the learners. If the learners cannot afford to buy them, audio and video cassettes can be stored in school and college libraries. In fact, the library of the future should have a good stock of audio and video

cassettes, and that should be the aim in Pakistan too. In view of the limitations of television greater use is being made of video cassettes It has been found to be very useful: (i) as a method of self-study, especially for weak students; (ii) as a means for teacher training; (iii) as a means for bringing industrial progress to the classroom, and; (iv) it is helpful for continuing education in an off-campus environment. Further, in the engineering education system of the country, we have inadequately equipped laboratories and 30-40 per cent of the faculty positions are vacant. In such a state of affairs, video instruction can significantly raise the quality of on-campus engineering education in Pakistan. This is applicable not only to engineering universities but also to colleges all over the country which do not have properly equipped laboratories and qualified teachers. The video can adequately supplement classroom instruction.

New developments in the electronic media, such as video discs and video texts are increasing the capacity of the television set. Video disc is a system similar to long-playing records of old, except that it carries both audio and video through a conventional television set. The video disc, particularly the optical disc, has an enormous storage capacity. Optical discs can store 1,00,000 tracks and 54,000 on each side. The entire Encyclopaedia Britannica can be stored on a single disc with room to spare. Video text allows home television sets to function like a computer terminal and retrieve information and graphics from a remote data base. A video text system would be very useful in disseminating general information about courses and programmes available through distance education.

In several countries telephones are used, particularly in distance education to provide interaction between the tutors and students. These, however, can be used only in countries where telephones are within the reach of the ordinary man, and, more important, where they work very well.

There are countries which are using audio and video conferencing. For instance, in Canada tele-conferencing is being used in several educational programmes, including professional development courses in medicine, law, teacher education, health science, business and management.

These are the new technologies available in the world and are being used widely and effectively in some countries. However, they cannot be blindly used everywhere without relevance to the needs and development of the area.

9.2. OBJECTIVES.

After reading this material, it is hoped that the student will be able to:-

1. identify the important new innovations in educational technology;

2. discuss the role of computer in education;
3. explain the significance of satellite system in teaching-learning process;
4. specify the role of teleconferences in education; and
5. evaluate the role of interactive video in education.

9.3. COMPUTER.

Technological and scientific development is responsible for surprises in every walk of life. The latest invention is the computer which is used, apart from other things, to meet educational objectives.

1. Computer can be used to develop the creativity of students rapidly and to infuse in them the ability to solve problems.
2. They can work as additional teaching equipment in the laboratory and has other practical applications too.
3. They can help in imparting education to handicapped children such as the deaf and dumb.

The use of computers has been increasing rapidly in Pakistan. These days universities have opened separate computer departments. In addition to training people, computers are also used for research work. The results in the Board examinations are being prepared these days by computer.

9.3.1 *Limitations*

The computer has certain limitations too. For example:

i) It is very expensive to use a computer in the classroom.
ii) Operating a computer is a technical task, there is always the possibility of the equipment being damaged by the students.
iii) All subjects cannot be taught through computer easily. There is always shortage of programmes with suitable educational objectives.
iv) Repair, maintenance and servicing of the computer can be serious problems for educational institutions.
v) It creates indiscipline, absence, carelessness and waste of time, because of its being an auto-operational teacher.
vi) Due to lack of trained personnel and monotonous methods of teaching by computer, it may be risky to impart education through this device.

According to the World Encyclopedia the future of computers is very bright.

"In future the use of computer will go on increasing because it will respond to our questions properly and solve our problems immediately. Even these days verbal answers and certain information can be obtained from computers after telephonic conversation. There are certain computers which exchange information between them. The computer can solve may questions at a time. Answers can be made available by the computer verbally or on the T.V. screen or can be typed".

Computers are now found in every school in all advanced countries. It has started in our country also because we have been laying stress on the qualitative aspect of education in the fast the present changing social and economic situation. Computer is the best medium for effective teaching-learning process.

Computer is being used by only a limited number of educational institutions in Pakistan. It has been showing surprises in every walk of human life, and has made possible innumerable calculations within seconds.

9.3.2 *What is a computer*

Computer is an electronic machine which helps us to solve countless problems with speed and accuracy. It makes calculations, comparisons, and also stores information. In other words computers can access and process data a million times faster than human beings. They respond to our queries. Computers are also capable of printing out information.

Computers are composed of switches wires, motors, transistors, and integrated circuits assembled on frames. The frames form components such as typewriter, line printers, card readers, and punches, magnetic tape drives, and central processing units. The components are wired together into a new work called Computing System.

According to USASI "Computer means a device capable of solving problems by accepting data, performing described operations on the data and supplying the result of these operations".

9.3.3. *Working on the computer system.*

1. Computers consist of input equipment, key-board and cassette recorder. It receives information from outside, so that it can

respond accordingly.

2. The output department transforms the information into understandable form.
3. The memory department stores whatever information is needed. It stores the information and keeps it in its memory so that it can be reproduced whenever needed.
4. Computer has an arithmetical and logical mind which helps in transforming all types of information into workable suggestion and making calculations.
5. A subsystem controls the implementation of programmes and performs all the subsidiary activities.
6. Computer is a hardware equipment. software department contains programmes prepared by computer programmers. Computer works as per the instructions of the programmer. Computer is not an independent thinking equipment.
7. Computer has its own language, such as BASIC, LOGO, PILOT, COBOL, FOXPRO, TURBO C, etc. Certain operations are given code numbers such as Add-1 Substract-2 etc. The code numbers are transformed into computer language.

9.3.4. *The advantages of computer in education.*

The computer has come to occupy a very important place as an effective system of educational instruction. It is also used as self instruction method for as individualised teaching.

The computer has overwhelmed trade industry and administration by the variety of its uses, its speed and its accuracy . Its impression is clearly visible in education. It has influenced affected instructional process, research work and examinations.

According to Brookner there are two methods of teaching by computer.

1. Students remain active when teaching is imparted through computer.
2. Computer controlled teaching guides the teacher in implementing his instructional technology. The teacher has to depend on the hardware and study material. Generally, students cannot keep contact in line with the computer process, and the task need not be completed within a prescribed time limit. Teaching materials are not stored.

Computers can be used effectively as compulsory teaching aids. The following facts will throw light on the uses of computer:

1. Computers are being used in teaching methods and educational institutions

for solving teaching problems.

2. Computer is being used in educational institutions for keeping record of the admission purposes in medical and engineering colleges and various other fields. It is also used for preparing results, admission ticket, for examination, preparing marksheets, certificates, etc.
3. It helps students in the development of different skills.
4. It can play the role of enquiry office. Students ask questions and it answers them out of the answers already stored in it.
5. Computer can work as a teacher by maintaining proper records of actions, reactions and lectures of individual students.
6. Computer can be used to train students through artificial game-techniques.

For further details, please read the below referred book.

Das, R.C. (1993)	Educational Technology; A Basic Text, New Delhi, Sterling Publishers (Private) Limited, PP.174-214.	9-1

9.4 SATELLITE SYSTEM

Summing up the impact of satellite on distance education, Geoff Potter of Canada has observed in his paper 'Satellite-based Distance Education: Problems and Solutions' (1981), "In some cases Hermes (the satellite) brought people together in a way that was every bit as emotionally moving as it was intellectually stimulating. In other cases, students became bored, technical problems made effective interaction impossible, information seemed colourless and static". Nevertheless, Potter points out, the satellite has explored for us the possibility of using such devices for the masses in providing basic information about literacy, health care, agriculture and population control. This would naturally widen the scope of distance education.

About the use of audio-visual electronic programmes, A.M. Nashif has observed in a paper "Communication Media--an Integral Part of Distance Education Curriculum" that "any audio-visual electronic programme used must be complemented by other media to ensure dialogue, such as telephone conversation or written answers or direct confrontation" (1981).

For further details, please read the below referred book.

David Sewart, Desmond Keegan and Borje Holmberg (1983)	Distance Education: International Perspective, London, Croom Helm. PP. 242-250.	9-2

9.5 TELECONFERENCE

Television has been considered all over the world as the most important media in bringing about desired social and cultural changes among the masses. It can revolutionize the thinking of the people and lead them towards constructive and productive work in various aspects of the economy of a country. Its importance has been recognized both by the underdeveloped and developing countries of the world. It is the most potential instrument in educating the masses and thereby narrowing down the gap of progress between the developing and developed countries of the world.

For a country like Pakistan which has vast and inaccessible areas, different climatic conditions, and a large and ever-growing population, T.V. can be an important central media exceedingly useful in providing functional, formal and non-formal education to the masses. In order to make speedy headway towards the development of the country as a whole, there is no other important medium except television which can educate the masses and serve as a tool of motivating and educating the younger generations through formal, non-formal and informal education. It can also help in bringing about social and cultural changes bearing on art, music, drama and literature. It is through television that stimulating and thought-provoking views of renowned statesmen, scientists, educationists, artists and teachers can be shared by all. Television helps in emphasizing public understanding of social, political and scientific advancement of a country.

Slow scan television is essentially a document transfer system which is often associated with telephone teleconferencing, or early low-powered satellite systems. As a communication system SSTV has useful application where: (i) illustrative material generated during a tutorial session needs to be transmitted to students immediately: and/or (ii) where a mail or postal system is unable to ensure mailed documents reaching students in time.

For further details, please read the below referred material.

Garrison, D.R. (1989)	Understanding Distance Education, London, Routledge, PP.64-77.	9-3

9.6 INTERACTIVE VIDEO

Interactive technologies are those which usually combine two or more technologies to allow the students to interact with the combined resources and facilitate their own learning. With careful planning many technologies can be made to be interactive to a greater or lesser extent. However, the archetype of interactive technology is the video/computer combination. The video may be in

the form of a video disc (faster access, fine quality still frame) or video cassette (Cheaper to make, slow access, little or no still frame) and a microcomputer.

This combination is at the cutting edge of educational technology and a great deal of experimentation is required by users before it can be said to be a truly cost-effective technology. One of the greatest problems of all new technologies is the bandwagoning effect. As soon as a new technology appears a first wave of enthusiastic users tries it out only to lose interest when the need for sustained effort and patience becomes apparent. Unfortunately, first wave enthusiasts often collect the resources as they sweep along making difficult for the second, third, and later waves to develop viable software. The lesson is that once technology is adopted an institution must be prepared to adequately resource it so that it may be developed to its fullest potential over a long period of time.

In order to comprehend the idea of interactive video, please read the below referred material.

Lalita Rajasingham (1989)	Distance Education and New Communications Technologies, New Zealand, ISDN, PP.79-84	9-4

9.7 ACTIVITIES

1. Discuss the role of computers in education with your tutor in the study centre and prepare a report of the outcome of your discussion.

2. Write below any three benefits of the satellite system in imparting education and training to the public at large.

   _____

   _____

   _____

3. In how many countries do you know that teleconferences are being used for effective teaching? Name the countries.

   _____

   _____

   _____

4. Prepare a list of A.V.Aids in your study centre. Also write below the advantages of interactive video in learning.

9.8 EXERCISE

Hopefully, you have studied the unit, now please do the following questions:

Q.No.1 Discuss the five key elements of a computer system.

Q.No.2 What is systems software? Explain the function of Compiler Data Based Management System (DBMS) and communications software.

Q.No.3 Discuss four different ways of using CAL (Computer Assisted Learning).

Q.No.4 Explain the important areas of CML (Computer Managed Learning).

Q.No.5 Discuss the administrative uses of the computer.

Q.No.6 Critically examine the role of computers in education.

Q.No.7 Discuss the role of satellite in imparting education to the public at large.

Q.No.8 Explain the system of satellite. How does it works?

Q.No.9 Critically examine the Advantages and disadvantages of the satellite system.

Q.No.10 Discuss the role of teleconferencing in education.

Q.No.11 To what extent do you agree that teleconference is an effective media and its use in Pakistan will be fruitful? Discuss.

Q.No.12 Explain the benefits of interactive video in teaching-learning process.

Q.No.13 Critically examine the advantages of an interactive medium over distance education.

Q.No.14 "Computer and communication technologies have joined together to produce a new hybrid technology for delivering home based services". Discuss.

9.10 BIBLIOGRAPHY

1. Das, R.C. (1993) — Educational Technology: A Basic Text. New Delhi, Sterling Publishers (Private) Limited.

2. David Sewart, Desmond Keegan and Borje Holmberg (1983) — Distance Education: International Perspective. London, Croom Helm.

3. Garrison, D.R. (1989) — Understanding Distance Education. London, Routledge.

4. Lalita Rajasingham (1989) — Distance Education and New Communications Technologies. New Zealand, ISDN.

5. Romiszowski, R.A. (1984) — Producing Instructional Systems. London, Kogan Page.

6. Sharma, R.A.(1993) — Advanced Educational Technology. Meerut, Loyal Book Depot.