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PERSPECTIVES OF EDUCATIONAL TECHNOLOGY  
II - Semester
Directorate of Distance Education

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PERSPECTIVES
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Education is a very important and integral part of society that governs social functioning. It deeply connects with the wants and ambitions of every society. This is the reason that education cannot remain unaffected by any social change that takes place around us. Hence, any advancement in technology has a direct or indirect impact on the methodology of education in the current scenario.

In general, there is active participation and involvement of radio, television, computers, machines, films, and now the Internet and multimedia, in providing education and educational material to students. This is referred to as educational technology. The significance of educational technology has increased due to its capability to achieve desired goals related to making education universal, preparing teachers and upgrading curricula in every phase of education.

The book *Perspectives of Educational Technology* is written strictly in SIM (Self Instructional Material) format for Distance Learning. Each unit starts with an Introduction and Objectives. Then, the detailed content is presented, along with figures and tables, in an understandable and organized manner. Each unit will also have Check Your Progress questions to test the readers’ understanding of the topics covered. A Summary along with a list of Key Words and a set of Self Assessment Questions and Exercises is also provided at the end of each unit for effective recapitulation. Each unit also has a list of books for Further Readings.
UNIT 1   EDUCATIONAL TECHNOLOGY

1.0  INTRODUCTION

Educational technology is a system in education in which machines, materials, media, men and methods are inter-related and work together for the fulfilment of specific educational objectives. Technology Explosion has yielded several new machines, materials and media which have great potential for use in the educational enterprise. A judicious use of these, together with new functions and roles of educational personnel, can make the process of teaching-learning more efficient and effective.

Educational technology is an applied or practical study which aims at maximizing educational effects by "controlling" such relevant factors as educational purposes, educational content, teaching materials, educational environment, conduct of students, behaviour of instructors and interrelations between students and...
Educational Technology

instructors. It is a branch of study in which the benefits of engineering techniques, information science, natural sciences, behavioural sciences and human technology are to be used to promote the efficiency of education. In practice, the school treasury and administration, the school and classroom management and the work of instruction (intellectual education, moral education, counselling), all can make use of educational technology.

In this technological era, the evolution of terms such as chemical technology, printing technology, leather technology, bio-technology, has affected the field of education to give wide currency to the concept of educational technology. This phrase, though coined and used four decades ago, as first encountered in the Brynmor Jones Report in UK, has undergone vast changes in its connotation over the years. Yet it remains flexible enough to accommodate every subsequent novel technique and process that concerns positive learning.

At the outset, the term can be taken to mean two things—introducing technological innovations in the field of education or technologizing education to optimize learning endeavours.

In time, the scope of educational technology got steadily enriched to reach the stage where it is now a systematic science of its own, permeating the entire educational scenario.

Wider Meaning of Educational Technology

The National Council of Educational Technology Report—UK (1969) gave a wider meaning to educational technology in these words, “It perhaps needs to be reiterated that the Council sees educational technology as having a wider connotation than simply the use of electro-mechanical and other aids in teaching. It places as much stress on educational ideas as on technological inventions, largely because it accepts that fundamental advances usually come from the interaction of changing concepts (leading to new ways of looking at things) with changing techniques (leading to new ways of doing things).”

1.1 OBJECTIVES

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

- Define educational technology
- State the meaning and scope of technology in education
- Discuss the phases of technology in education
- Explain the foundation of educational technology with reference to various disciplines
- Describe the system approach
- Examine the system approach as applied to educational technology
1.2 MEANING AND SCOPE OF TECHNOLOGY IN EDUCATION

Let us begin our discussion on Educational Technology.

(a) Technology of Education

Technology of education is inherent in education itself. It refers to the application of behavioural sciences like psychology of educational theories and practical teaching-learning problems, instruction, motivation, etc. It is concerned with the study of educational problems and the techniques to be used in solving those problems to achieve best results. Broadly speaking, technologies of planning, financing and administration are also covered under the concept of technology of education. Techniques of curriculum planning, transacting and evaluating also come under its purview. Here, we use the principles derived from psychology of learning.

In general, the following techniques are used to meet the objectives of the concept:

1. Analysis of instructional problems.
2. Selection of instruments for evaluation.
3. Selection of strategies to obtain the desired result from the teaching–learning process.
4. Teacher behaviour.
5. Programmed learning.

(b) Technology in Education

The term ‘technology in education’ is a service concept, like ‘technology in the service of agriculture’, or ‘science in the service of mankind’. It refers to the use of equipment and machines for educational purposes. It involves the use of a wide range of audio-visual equipment, hardware and sophisticated electronic devices like film, digital movie cameras, projectors, radio, television, tape/digital recorder, teaching machines, computers, the Internet, etc. As explained earlier, ‘educational technology’ is a term with a much wider perspective than, say, ‘Technology in the Service of Agriculture’. It includes hardware approach, software approach and systems approach to technology, but transcends their gamut to encompass many other disciplines including the psychology of learning, behavioural sciences and even anthropology. Technology in education, however, refers specifically to the application of engineering principles and technology in the process of education. Basically, technology in education boils down to hardware technology, as applied to educational systems.

Silverman (1968) referred to technology in education as ‘relative technology’ and technology of education as ‘constructive educational technology’.

Educational Technology
1.2.1 Phases of Technology in Education

Broadly speaking, educational technology has passed through five stages.

1. **The first stage** of educational technology is linked with the use of audio-visual aids like charts, maps, models, specimens and concrete material. The term educational technology was used as a synonym for audio-visual aids.

   It is said that good teachers have always used visual aids to make their teaching more effective. The Greek geometers had drawn diagrams of the earth, and the Czech educator John Amos Comenius (1592–1670) appealed to teachers to use those ancient illustrations and models to boost the interest levels of their students.

   The second stage of educational technology is linked with the ‘electronic revolution’ which ushered in an era of sophisticated hardware and software. The projector, tape-recorder, radio and television transformed the educational scenario. Accordingly, educational technology was described in terms of these sophisticated instruments and equipment for presenting instructional material.

   The third stage of educational technology is linked with the mass media which led to ‘communication revolution’ for instructional purposes. Computer-assisted instruction also became popular.

   The fourth stage of educational technology is marked by the individualized process of instruction. The invention of programmed learning and programmed instruction gave a new dimension to educational technology. A system of self-learning based on self-instructional materials and teaching machines emerged.

   The latest concept of educational technology is influenced by the concept of systems engineering or system approach. According to it, educational technology is a systematic way of designing, carrying out and evaluating the total process of teaching and learning in terms of specific objectives based on research.

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**Check Your Progress**

1. What is the meaning of technology in education?
2. State the first stage of educational technology.

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1.3 FOUNDATIONS OF EDUCATIONAL TECHNOLOGY: PSYCHOLOGY, SOCIOLOGY, HUMAN ENGINEERING, COMMUNICATIONS AND MANAGEMENT

This is the age of Information Technology (IT). It is an era of heavy reliance on technology for our day-to-day activities. The task of human has become easy and simple due to the help of science and technology. Human work has become near perfect and highly efficient. Technology has also made the process of teaching-learning simple. It has made it more comprehensive and easier. It has provided
access to more information than ever before almost instantly while making the
process more interactive. Educational Technology (ET) in the broadest sense
includes the creation, application and evaluation of systems, techniques and aids
in the field of teaching and learning. This also brings variety to classroom teaching,
displaying more information to learners and improving students learning. The use
of technology saves both time and energy. It captivates the learner’s attention in
ways beyond the scope of an unaided lecturer. Due to rapid technological
development in the years to come the future of teaching at schools, colleges and
universities is going to change drastically. Educational technology covers all aspects
related to the facilitation of education and the teaching-learning process. There
are hardly any areas left, where you do not feel the impact of technology.

What do you understand by the term educational technology? For most
people, the term ‘edutech’ is associated only with the tools and with the physical
hardware, which is used, viz. computer, television, Overhead Projector (OHP)
and so forth. However, the concept of edutech should not be confused with just
the electronic gadgetry; they are just a means to an end. Edutech in itself has a
wider meaning, as broad as education itself. By this statement, it is clear that
edutech is concerned with the design and evaluation of the curriculum and not just
the superficial enablers and gadgets. You, as a practitioner using the technologies
available to you in your workplace to make your presentation more effective and
communicative, is basically an example of edutech.

Now we are going to introduce edutech and erudition experiences provided
within and outside the classroom, and also with the problems of implementing
these resources. Technology has been a part of the learning process whether it is
in the form of printed books, writing instruments or audio-visual media.

Let us understand the meaning of the term ‘edutech’ by splitting it into
‘Education’ and ‘Technology’. Technology refers to the methodical application of
procedures and doctrine of sciences to achieve an objective efficiently and
effectively. ‘Technology’ is that branch of advanced scientific study which involves
highly sophisticated and intricately designed engineering software and hardware.
It deals with the use of knowledge for achieving practical objectives. Technology
results in new designs and gadgets that improve human productivity. Education is
the process of socialization, modification of behaviour, adjustment to the
environment, acculturation, harmonious and social efficiency with all round
development of the human persona. Hence, edutech is the study and ethical
application of facilitation in learning and enhancing performance by making, using
and organizing appropriate technological resources and processes. As a field of
study, edutech emphasizes on communication skills and advances in teaching and
learning through the thoughtful integration and use of diverse media. Practitioners
in edutech seek innovative and efficient ways of arranging the teaching-learning
process through a fine application of technological developments. These actions
rely upon a body of knowledge and understanding of it to the fullest for ethical and
successful implementation, rather than as habitual routine or as out-of-the-way
technical skills.
According to Ellington (2005), there is a boost in the efficiency. This boost is mainly due to the use of edutech in an assortment of situations. This use can be manifested in different ways, which are given as the following:

(i) Increasing the class of learning to a superior quality and increasing the degree of mastery amongst the learners;
(ii) Reducing the time required by the learners to attain their goals;
(iii) Improving the efficiency of educators in terms of total number of learners taught, without a noticeable reduction in the quality of learning;
(iv) Decreasing the costs incurred, without having an adverse effect on the quality; and
(v) Decreasing the dependence of learners, and increasing the flexibility of learning and instructional provisions.

There have been quite a few definitions of edutech which have been made available by scholars and researchers over the years.

Edutech has given us the means to increase our reach and facilitate learning for a large number of people in inaccessible and remote areas, decreasing the qualitative disparity in educational institutes available to the less affluent and disadvantaged. It also increases the access for individualized lessons for learners conveniently suited to what they need and their pace of learning (NPE, 1986).

Edutech is a communicative process resulting from the application of scientific methods in the behavioural sciences of teaching and learning. This process might or might not require the use of media such as television, radio, broadcasts, cassettes and so forth (UNESCO, 2001).

Let us talk about the types of edutech on the basis of their applicability. We shall use the approach-based explanation to edutech in the next section. In Table 1.2, you will see the dissimilarity between instructional technology, behavioural technology and teaching technology which you apply during the teaching-learning process.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Teaching Technology</th>
<th>Instructional Technology</th>
<th>Behavioural Technology</th>
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<tr>
<td>Exponents</td>
<td>Herbart, Morrison, Hunt, Davies, Gage, Gagne, Bruner and Glasser</td>
<td>Skinner, Glazier, Crowder, Mager, Gilbert, Ausbel</td>
<td>Skinner, Flanders, Amidon, Anderson</td>
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<tr>
<td>Objectives</td>
<td>Development of cognitive, affective, and psychomotor domain</td>
<td>Development of cognitive domain</td>
<td>Development of cognitive, affective, and psychomotor domain</td>
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<tr>
<td>Components</td>
<td>Emphasis on content and communication content. Teacher and students are major components</td>
<td>Emphasis on structure of content, its organization and presentation. Students are the more active component.</td>
<td>Communication is the most important component. Both students and teachers are active in the process of interaction.</td>
</tr>
<tr>
<td>Place of Teacher</td>
<td>Manager</td>
<td>Helper</td>
<td>Secondary</td>
</tr>
<tr>
<td>Foundations</td>
<td>Philosophical, sociological, psychological, and scientific base</td>
<td>Psychological and scientific</td>
<td>Psychological and principles of cybernetics</td>
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</tbody>
</table>
Let us observe different types of edutech on the basis of approach.

Emergence, borrowing and convergence

During a variety of stages of the advancement of edutech, there are stages of its emergence, its borrowings from various other fields, and its contribution to or in junction with various fields of study. Before we take up these three facets, it is imperative to note that in the early 1960s, edutech emerged as an occupational category with specialized jobs or field of work; and that is the phase when edutech was formally accepted to a status it has since owned. As you would have noticed the appearance of edutech can be traced to ‘av aids’ and ‘programmed learning’. Therefore, it is not unexpected that many educational technologists owe their derivation to these two turfs. The audio-visual movement facilitated student education within the classrooms by improving their willingness to learn, attention and other stimulus, and also out of the classrooms through the help of mass media like television. On the other hand, the planned learning movement made possible the ‘individualized learning’ which has by far been the chief domain of distance education and other computer-aided learning (Panda, 1990).

In the following section, we will focus the four developments within ET: i) audio-visual aids, ii) instructional technology, iii) individualized learning. Following this section, we shall expand on these four aspects and including many other developments within a historical perspective.

(i) Audio-visual aids

The beginning of the development of edutech was the use of various audio-visual (AV) aids to enhance the quality and quantity of communication so as to assist
teacher’s presentations and student’s learning. This was proposed to increase the variety and accuracy in the presentation of information. The AV approach emerged in 1928 which later on led to the use of electronic and optical equipment. This approach combined both hardware and software:

- **Hardware**: Equipment such as Overhead Projector (OHP), tape recorder, micro-computer.
- **Software**: Computer programmes, overhead transparencies, audio programmes, learning materials.

Though many educators have not considered this aspect to be included at all within edutech, many educational technologists argue that the beginning of this field lies with the use of audio-visual aids. The advantages of AV aids were that it illustrated both the abstract learning and verbal communication experiences so that learning experience became more concrete. The disadvantages were that teachers used to lay more stress on the use of AV materials than their actual desired usefulness in teaching–learning process.

The AV approach may be referred to as ‘technology in education’.

During the 1950s, there were advances in communication theories which were useful for the use of AV to teaching-learning. While earlier, the emphasis was on the end result, this new development focused on the method of communication. This resulted in successful communication through educational TV programmes, and later through computer based programming. Therefore, both radio (and audio) and television (and video) had to have ideology of design for learning (or instruction) which diverged from the way verbal classroom communication (or teaching) took place. Subsequently, both AV aids and communication processes, combined with the developments in learning theories, which led to the development of the area of instructional technology and instructional design.

(ii) Instructional technology

There were steady developments in various learning theories, starting with ‘behaviourism’ which applied laboratory experiments to human learning (and teaching-learning). ‘Technology of education’ was the result of the mutual contribution of instructional scientific research, learning theories and educational research. Instead of focussing on the use of audio-visual aids, this approach (called ‘instructional technology’) emphasized the intangible aspects of learning and the techniques of teaching-learning. The technology of education included hardware, software, courseware and instructional strategy. Following the application of physical sciences and engineering technology ‘instructional devices’ were developed; and the application of learning theories led to developments in ‘technology of learning’. Considerable research took place in the area of the science of human
learning, and their application to the design of teaching-learning strategies (and various media to facilitate them) – this precisely led to the development of the field of ‘instructional technology’. Later on, cognitive and constructivist psychologists contributed to this aspect. Cognitivism contributed to the design for remembering, problem-solving, thinking, reasoning and major contributions came from Piaget.

Self-instructional strategies such as programmed learning were developed; and teaching or instruction was designed based on definite principles of learning theories. The research of Glaser (1976), Reigeluth (1979), Merrill (1983) contributed to designing for instruction, instructional strategies and development of instructional systems/instructional systems design.

The later developments in constructivism (Jonassen, 1991) led to the design on the individual construction of knowledge and group negotiation of meaning. The developments in Web 2.0 and social technology have significantly contributed to the constructivist view of learning and enrichment of individualized learning.

A simple form or process of instructional design includes the setting of learning objectives, development of instructional materials and procedures (i.e., actual teaching-learning), and assessment and evaluation at the end (on which feedback is provided to further revise learning objectives) based on the learner’s style and pace of learning and the teaching-learning processes, and also an in built mechanism for revisiting also for revising the teaching-learning process itself.

(iii) Individualized learning

The area of individualized learning developed from programmed learning onwards, especially, following the works of B.F. Skinner (1954). This further led to the development of individualized learning packages, systems of personalized instruction, and system-based instructions formed as a model. Subsequently, further research led to development in mastery learning, Keller’s personalized system of instruction, individually guided instruction modular instruction, Knowles’ (1975) audio-tutorial systems, learning contracts, among others. With the developments and refinements in computer-assisted learning (CAL) (especially, personal computers), CAL has acquired a prominent position in teaching-learning today.

Check Your Progress

3. Define technology.
4. How does edutech assist in the teaching-learning process?
5. What is the AV approach?
1.4 SYSTEMS APPROACH AS APPLIED TO EDUCATIONAL TECHNOLOGY

NOTES

Systems Approach is an innovative and rational problem-solving method of analysing the educational system and making it more effective. It views the educational process as a whole with all its dimensions and components like pupils, teachers, curriculum, teaching media and materials instructional strategies, physical environment and evaluation of instructional objectives.

According to ‘the educational technology as systems approach to education’, the entire teaching-learning process is taken as cybernetic or organic which is self-generating as well as self-controlling. As the general health of an individual depends upon working conditions of different sub-systems like respiratory, digestive, circulatory, the educational achievement and progress at a particular stage is proportional to the functional efficiency of various sub-systems like teacher, supervisor, administrator, librarian evaluator, and so on. Integration and interaction among all these agencies are to be promoted for overall efficiency.

1.4.1 Meaning of Systems Approach

Educational system may be compared to an organism or a machine in which all the parts or components are interdependent and their interaction is dynamic. In an organism there are living cells which are acting in different directions individually and contributing towards common goal at the same time. In a machine, there are various parts like engine, wheels, steering chassis and so on which have their individual functions and at the same time helping the machine to do its job. Both the organism and machine have a particular purpose or goal to realize and all their parts are tuned or oriented or geared to achieve this goal. Thus, in spite of being individual entities, common goal is aimed at through coordination, cooperation and integration.

UNESCO has also given the example of human body in explaining a system. Besides a large number of living cells, different sub-systems and units like circulation system, nervous system and digestive system function within the large system of the human body independently and jointly for existence of the body itself.

The system is thus “a complex set of ‘connected things’ or ‘organized body of materials or things’”. It is an assemblage of objects or units with regular interactions and inter-dependence collectively contributing towards an overall and complex function.

Definition

The systems approach in instruction is an integrated programmed complex of instructional media, hardware and personal whose components are structured as a single unit with a schedule of time and sequential phasing.
According to Keshaw and Michean

“Systems approach is one of the techniques which aim at finding the most efficient and economically intelligent methods for solving economically intelligent methods for solving the problems of education scientifically.”

1.4.2 Phases of Systems Approach

Robb (1974) has analysed an instructional system and suggested that an instructional system can be employed into three phases:-

Planning, Execution and Evaluation; these phases involve seven steps and indicate the development of instructional system.

Phase First - Planning instructional system

Step 1. Defining objectives
Step 2. Pre-assessment or determining entering behaviour
Step 3. Specifying appropriate strategies

Phase Second - Execution of instruction

Step 4. Defining and assigning personnel roles
Step 5. Synthesizing and implementing the system of instruction

Phase Third - Evaluation of instruction

Step 6. Evaluation of outcomes
Step 7. Analysing results and modifying the system

Systems approach or systems analysis is a systematic way of identifying goals of any system and scientifically working out different steps to move towards these goals. It has been aptly mentioned in the “Learning to be” that “it is precisely a characteristic of systems analysis to integrate uncertainty into daily action. Be this as it may, to the extent that it enables us to orchestrate many agents into a unified process leading to the greatest possible efficiency, systems analysis would appear to be an intellectual instrument which may be applied to an overall critical study of existing educational systems and is likely to suggest new scientifically calculated pedagogical patterns”.

With a view to improving the teaching-learning (input-output) process at the outset the instructional objectives should be formulated and the operational behavioural objectives be decided in the light of instructional objectives. Adequate linkages should be established between the inputs and outputs and a feed-back system be developed for bringing about necessary changes in the teaching-learning process. As Bloom has pointed out, this process is not merely cognitive. It operates in a social, emotional and effective environment. According to Panda, motivational and affective considerations have occupied a significant place in the learning process and outcomes.
1.4.3 Design and Management

Systems Analysis Operations

After the systems analysis, the investigator makes an attempt to design a tentative solution of the problem. A new solution of the problem is subjected to testing. A tentative solution and retesting the tentative solution continues until on analyst reaches to an optimal solution. Once optimal solution is obtained the analyst departs that loop.

1.4.4 Steps in Systems Analysis

The systems approach should be introduced as an integral part of the whole educational environment and accepted by all concerned with the environment. Otherwise, it will not be effective and its implementation cannot bring about improvement. Formative evaluation and benchmark survey may be necessary for formulating objectives, subject-matter and strategies. Training and orientation of
teachers and educational planners in this systems approach are necessary for generating adequate awareness and imparting necessary knowledge as well as skills. The teacher has to plan for utilization of resources, use of media, etc. He should have a good knowledge of the subject limitations of the environment, individual differences of children and suitable methods as well as materials so that he can plan the system accordingly. The system approach involves continuous evaluation, the rules of which contribute to the revision of the plan wherever necessary.

The following steps are adopted in the systems approach in education:

(i) Definition of Instructional goals, behavioural objective and stating them in operational terms;
(ii) Determination of functions for achieving these objectives through the use of various media and materials;
(iii) Identification of learners’ needs and characteristics;
(iv) Selection of suitable methods for effective learning of the topic;
(v) Selection of appropriate learning experiences;
(vi) Choice of relevant materials media and resources for such experiences;
(vii) Assignment of appropriate personal roles as teachers, students, AV Personnel, librarian, etc.
(viii) Implementation of the programme starting with a try out under typical conditions;
(ix) Evaluation of the learning outcomes in the light of instrument/instructional and behavioural objectives; and
(x) Redefinition and revision of the goals, objectives content methods strategies, etc. for improving learning experiences.

Steps to be followed while using systems approach to the educational fields are discussed in detail:

(i) Formulation of Objectives

The most important step of systems approach is the formulation of objectives i.e. what is to be taught to the students, what and how many types of learning experiences are to be provided. These objectives should be defined in behavioural terms and should be measurable. Before specification of these objectives, the objectives of entire system should be written.

(ii) Defining Learning Characteristics and Requirement

The next step of systems approach is to construct a test based on the objectives. This can inform us the characteristics of the pupils and their needs. This test is known as the criterion test.
(iii) Selection of Appropriate Methods
The next step of systems approach is the selection of appropriate methods and strategies. The methods, strategies and tactics are to be selected keeping in view the pupil’s personality and the subject matter so that the subject may be learnt effectively.

(iv) Selection of Appropriate Learning Experiences
The next step is the selection of appropriate learning experiences. These are also to be selected in advance.

(v) Selection of Appropriate Materials, Resources, Environment and Equipment
In this step, appropriate materials, resources, environment and equipment are to be selected so that the students may be provided with experiences.

(vi) Assigning Appropriate Personal Roles
In systems approach to education, the pre-determination of teacher’s role supporting personnel and the roles of the students is very important. Hence, prior to teaching, the roles should be defined.

(vii) Implementing the Programme
A system – model is prepared by integrating the selected strategies, methods and the proposed activities. Each variable or element performs the pre-determined activities smoothly. These activities are put to a trial on some pupils in particular situations.

(viii) Evaluation of Outcomes
After preparing a system and implementing it, the achievement of objectives must be evaluated.

(ix) Analysis of Results and Modification of System
After reviewing the results of evaluation, necessary modification in the system approach should be made so that the system can be made effective.

1.4.5 Characteristics of Systems Approach
The sophistication in the systems approach increases with the level of minuteness in the analysis. However, at whatever level of sophistication one may be operating, certain basic concepts of the approach will be still clearer if one goes through the characteristics of the system. These are as stated below:

(i) The concept: This refers to the dynamic order of parts and processes in mutual interaction and the whole is treated as greater than the sum of isolated parts.
(ii) **Relative concept:** Here, the school is treated as a system but it is also studied as a sub-system of a larger system, namely, a society. A classroom is a system but can be studied as a sub-system of a larger system, namely, school.

(iii) **System is either closed or open:** A closed system is such where new information is not accepted whereas in an open system, the teacher changes the content or style of his/her presentation in response to the information that is received from the learner.

(iv) **Goals:** All systems have goals and they come into existence for achieving the goals. Hence, a system may be examined in terms of the efficiency of achieving the goals.

(v) **Constraints:** All systems have constraints. A system does not work in a vacuum. It has an interface and is surrounded by other systems – the environment, e.g., a teacher finds that in spite of his/her good teaching, learners are not paying attention. But soon he/she finds out that this is all because of his/her very fast speaking and wrong pronunciation. He now provides them cyclostyled copies of the notes and it means the apparent constraint is transformed into a resource. Such a perception of constraints and resources is almost possible in any analysis of a system.

(vi) **Alternatives:** In any system analysis design, there are alternatives, though they happen under varied conditions. For example, computer of the school is not in a working condition. What is the alternative? The alternative is to make the teachers meet the students individually. However, this may not be practicable. What next? The teacher may give hand-outs which are self-instructive in a cyclostyled form.

(vii) **Feedback:** One important aspect of the systems approach is its effort in providing the periodic feedbacks.

(viii) **Reversibility:** The systems approach, particularly the open system, privies for the revision of the course. The revision can be in terms of repeating the steps, changing the sequence, changing the components, etc. Evaluation and revision are an integral part of all systems designing.

1.4.6 **Advantages of Systems Approach**

(i) It provides a conceptual framework on which to build plans for implementing changes in the educational process.

(ii) It helps to identify the suitability or otherwise of the resource material to achieve specific goals.

(iii) It helps to assess the resource needs, their sources and facilities in relation to quantities, time and other factors.

(iv) Technological advance could be used to provide integration of machines, media and people for attaining the defined goals.
(v) It permits an orderly introduction of components demonstrated to be required for the success of the systems in terms of students learning.
(vi) Rigidity in the plan of action is avoided as continuous evaluation affords the desired beneficial changes to be made.

1.4.7 Systems Approach in Education

As emphasized earlier, systems approach refers to a well-thought technique or rational approach for designing, controlling and using a system for realizing the system objectives in the best possible ways. Its application in the field of education will surely make the system of feedback and equilibrium. As a result, the systems approach to education is likely to solve various educational problems related with the organization and management of the process and products of education. The purpose served by the systems approach in education may be summarized now:

(i) It can effectively improve the instructional system.
(ii) It can bring efficiency in the school administration and management.
(iii) It may help in seeking the maximum effective utilization of the men and material resources.
(iv) A systematic educational planning (institutional, regional or national) in terms of long-range goals and specific short-range objective can be done by it.
(v) It may help in improving the examination and evaluation system.
(vi) Improvement in the organization of co-curricular activities and other educational aspects of bringing cognitive and affective development of the pupils can be brought.
(vii) It may help in maintaining, controlling and improving the guidance services of the schools.
(viii) It may help in improving the training and development programmes, e.g. the training of teachers (pre-service and in-service) may be effectively improved.
(ix) It may prove an invaluable means for designing, controlling and improving the systems of non-informal and adult education.
(x) Over and above, it may render valuable services in improving the quality of education in all its aspects and dimension.

1.4.8 Application of Systems Approach to Educational Improvement and Classroom instruction

(i) It brings to educational management a scientific – quantitative approach for solving complex education administrative problems.
(ii) It enables education administrator to identify the actual problem and abstains a verified solution of the problem.
(iii) The training programmes can also be improved with the help of systems analysis. The new concept of management may be implemented in training programmes.

(iv) The sub-system of education is analysed to understand the actual problem and tentative solutions can be verified or tested on a segment of the system.

(v) Any change in the educational system can be brought objectively, empirically and economically with great utility with the help of system analysis.

Check Your Progress
6. Mention the phases of systems approach.
7. List any two advantages of systems approach.

1.5 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. Technology in education refers to the use of equipment and machines for educational purposes.

2. The first stage of educational technology is linked with the use of audio-visual aids like charts, maps, models, specimens and concrete material. The term educational technology was used as a synonym for audio-visual aids.

3. Technology refers to the methodical application of procedures and doctrine of sciences to achieve an objective efficiently and effectively.

4. Edutech seek innovative and efficient ways of arranging the teaching-learning process through a fine application of technological developments. These actions rely upon a body of knowledge and understanding of it to the fullest for ethical and successful implementation, rather than as habitual routine or as out-of-the-way technical skills.

5. The AV approach is basically the use of audio-visual aids which combined the use of both hardware and software. Later it led to the use of electronic and optical equipment.

6. Robb (1974) has analysed an instructional system and suggested that an instructional system can be employed into three phases: Planning, Execution and Evaluation; these phases involve seven steps and indicate the development of instructional system.

   Phase First - Planning instructional system

   **Step 1.** Defining objectives

   **Step 2.** Pre-assessment or determining entering behaviour
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Step 3. Specifying appropriate strategies
Phase Second - Execution of instruction
Step 4. Defining and assigning personnel roles
Step 5. Synthesizing and implementing the system of instruction
Phase Third - Evaluation of instruction
Step 6. Evaluation of outcomes
Step 7. Analysing results and modifying the system

7. Two advantages of system approach are the following:
   i. It provides a conceptual framework on which to build plans for implementing changes in the educational process.
   ii. It helps to identify the suitability or otherwise of the resource material to achieve specific goals.

1.6 SUMMARY

- Educational technology is a system in education in which machines, materials, media, men and methods are inter-related and work together for the fulfilment of specific educational objectives.
- Technology of education is inherent in education itself. It refers to the application of behavioural sciences like psychology of educational theories and practical teaching-learning problems, instruction, motivation, etc.
- The term ‘technology in education’ is a service concept, like ‘technology in the service of agriculture’, or ‘science in the service of mankind’. It refers to the use of equipment and machines for educational purposes.
- For most people, the term ‘edutech’ is associated only with the tools and with the physical hardware, which is used, viz. computer, television, Overhead Projector (OHP) and so forth.
- Edutech is a communiqué process resulting from the application of scientific methods in the behavioural sciences of teaching and learning. This process might or might not require the use of media such as television radio, broadcasts, cassettes and so forth (UNESCO, 2001).
- The beginning of the development of edutech was the use of various audio-visual (AV) aids to enhance the quality and quantity of communication so as to assist teacher’s presentations and student’s learning.
- The beginning of the development of edutech was the use of various audio-visual (AV) aids to enhance the quality and quantity of communication so as to assist teacher’s presentations and student’s learning.
- Systems Approach is an innovative and rational problem-solving method of analysing the educational system and making it more effective.
Educational Technology

Educational system may be compared to an organism or a machine in which all the parts or components are interdependent and their interaction is dynamic.

The systems approach should be introduced as an integral part of the whole educational environment and accepted by all concerned with the environment. Otherwise, it will not be effective and its implementation cannot bring about improvement.

1.7 KEY WORDS

- Educational technology: It is a system in education in which machines, materials, media, men and methods are inter-related and work together for the fulfilment of specific educational objectives.
- Systems approach: It is an innovative and rational problem-solving method of analysing the educational system and making it more effective.
- Electronic revolution: It refers to the advancement of technology from analogue electronic and mechanical devices to the digital technology available today.
- Programmed learning: It is educational technique characterized by self-paced, self-administered instruction presented in logical sequence and with much repetition of concepts.
- Constructivism: It is a theory of learning based on the idea that knowledge is constructed by the knower based on mental activity.

1.8 SELF ASSESSMENT QUESTIONS AND EXERCISES

Short Answer Questions

1. What is the meaning of technology in education?
2. How is technology of education different from technology in education?
3. Briefly mention the phases of technology in education.
4. How does edutech help in preparing effective teachers?
5. List the characteristics of systems approach.

Long Answer Questions

1. Discuss the foundation of Educational Technology with reference to various disciplines.
2. Discuss the scope of edutech in the Indian context.
3. Explain the systems approach.
4. Examine the purpose served by systems approach in education.

1.9 FURTHER READINGS


UNIT 2 COMMUNICATION

Structure

2.0 Introduction
2.1 Objectives
2.2 Definition, Meaning and Components of Communication
  2.2.1 Definitions of Communication
  2.2.2 Characteristics of Communication
  2.2.3 Importance of Communication
  2.2.4 Components of Communication Process
2.3 Types of Communication
  2.3.1 Intrapersonal Communication
  2.3.2 Intercultural Communication
  2.3.3 Group Communication
  2.3.4 Mass Communication
  2.3.5 Small Group Sharing Information and Large Group Sharing Information
2.4 Barriers to Communication
2.5 Answers to Check Your Progress Questions
2.6 Summary
2.7 Key Words
2.8 Self Assessment Questions and Exercises
2.9 Further Readings

2.0 INTRODUCTION

How do we express ourselves or interact with each other? What is communication? What role does information sharing play in our lives? Information sharing is simply the act of conveying information from one person or group to another. Every act of information sharing involves (at least) one sender, a message and a recipient. It is an essential part of our lives and is intertwined with all the activities undertaken by us.

Sharing of information by humans takes place right from the moment human beings are born till death. Thus, sharing information is also equally important as the other basic needs of life such as food, clothes and shelter. We communicate face-to-face with another person or speak with people in a group. We can also communicate with people located in far-off places, who may be from a heterogeneous group and be anonymous to each other, with the help of technology. We need to study the topic of information sharing because it is a complex process which consists of many elements and is also beset with a number of barriers. It is essential to take these elements into consideration and try to remove these barriers so that sharing information becomes complete and attains its desired goal, which in our case, is to facilitate effective teaching and learning.

This unit will help you understand the process of communication, importance of communication, types of communication and the barriers to communication.
2.1 OBJECTIVES

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

- Define communication
- Discuss the process of communication
- Analyse the importance of communication
- Explain the types of communication
- Describe the barriers to communication

2.2 DEFINITION, MEANING AND COMPONENTS OF COMMUNICATION

Man is a social animal and his ability to communicate is the prime factor that distinguishes him from other animals. Apart from basic necessities, one needs to be equipped with good communication skills. We always want to share our thoughts, feelings, ideas and beliefs with other people around us. We can exchange information through words, gestures, signs and symbols, expressions; tone etc. One can also make use of technical media, like telegraphy, radio, television, computer and Internet for interaction. This interaction is called communication. Communication, derived from the Latin word ‘communicare’ which means ‘to share’, is the process of transmitting information and receiving it. Communication is a complex and ongoing process. It is a process of exchanging verbal and non-verbal messages. The way we communicate is a learned style. We grow up watching our parents and other people communicate with each other. As adults, we can learn improved ways of communication by observing others who communicate effectively, learning new skills and practising those skills. The ability to effectively communicate at work, home and in life is probably one of the most important sets of skills a person needs. In the process of teaching–learning communication plays a very important role. If a teacher is good communicator, only then will he/she be able to interact with students properly to make them understand his/her ideas or thoughts. Any idea or thought which is not shared is of no use. Hence, communication is must as it involves transmission of message by a sender and its proper understanding by the receiver.

2.2.1 Definitions of Communication

Some of the important definitions of the process of communication are as follows:

- W.H. Newman and C.F. Summer Jr. defined communication as, ‘an exchange of facts, ideas, opinions or emotions between two or more persons’.
• According to John B. Hoben, ‘communication is the verbal interchange of thoughts or ideas’.
• According to Martin P. Andersen, ‘communication is the process, by which we understand others and in turn, endeavour to be understood by them. It is dynamic, constantly changing and shifting in response to the total situation’.
• According to Warren Weaver and Claude Elwood Shannon, the authors of The Mathematical Theory of Communication, ‘communication involves all the procedures by which one mind may affect another. This involves not only written and oral speech, but also music, the pictorial arts, the theatre, the ballet, and in fact all human behaviour’.
• According to Merrithus, ‘communication is a process of mutual exchange of thoughts, ideas, facts and emotions’.
• According to psychologist and educational reformer John Dewey, ‘communication is a process of sharing experiences till it becomes a common possession’.

2.2.2 Characteristics of Communication

Communication has some basic characteristics, which are discussed as follows:
• **Purposeful**: Communication always involves a purpose. Whenever an idea or thought arises in the mind of a sender, he wants to communicate it. This means there is always some purpose behind it.
• **Universal**: Communication is the only way through which human beings can share information. Thus, communication is a universal process as it occurs almost everywhere.
• **Interactive**: Interaction is primary characteristic of communication in which two or more persons or groups interact with each other. It may result in social interaction. Thus, it is a two-way dynamic flow of information.
• **Imperfect**: A perfect communication is never possible in reality because what a person thinks can never be exactly understood by the receiver. This is because every individual is different from the other and perfect synchronization of minds is never possible.
• **Dependent**: Communication is performed with the help of some media. Communication is now carried out through various channels or modes, ranging from sophisticated communication media and technology, to non-verbal signals. So, it is dependent on some media through which message from one person could be sent to another.
• **Complex**: Communication is a complex process which involves various steps. A number of barriers can hinder this process at both ends (sender and receiver).
Communication

• **Contextual:** Communication always takes place within a context. The context of communication has at least four dimensions: (i) physical, (ii) social, (iii) psychological and (iv) temporal. These dimensions interact and influence, and are influenced by one another.

2.2.3 Importance of Communication

As we have already discussed, communication is nothing but transmission and understanding of message from sender to receiver. It is a very important aspect of human life because it is only through communication that human beings can interact with each other as individuals and as independent groups. It is an essential and basic process in all fields of life. Communication skills can be used virtually in every field. Effective communication is important because it allows people to lead more satisfying lives. Some other reasons which explain why communication is important are as follows:

• **Transmission of information:** Communication is must to transfer information between individuals and places. Any message which is not communicated is of no use.

• **Displaying ideas/emotions:** Whether it is in written or oral form, we always express ourselves by communicating with others. Without communication, we are not able to express our feeling or ideas. Hence, communication is important to transmit emotions/ideas.

• **Education:** The whole process of education involves imparting of knowledge to students by the teacher. However, this knowledge is imparted by various media which depend on communication. Education without communication is impossible.

• **In relationships:** Communication plays a vital role in building relationships between people. It facilitates dialogue, exchange of expression and emotions which result in relationships. The type of communication decides the relation. It could be personal or professional.

• **Entertainment:** To break away from the daily schedule of life full of stress, entertainment is a crucial part of everyone's life. Nowadays, every source of entertainment like movies, music, television shows, games, theatre or even anecdotes narrated by people involve communication.

• **Achievement of goals:** The importance of communication becomes much more crucial when we are on a mission, or need to achieve a goal. Without a means to communicate, an organization will become isolated. The ability to effectively communicate is very important to achieve the set goals.

• **Cultural promotion:** Communication offers a prospect to promote and preserve culture and traditions. It helps people in fulfilling their desire to be creative.
• **Integration:** It is with the help of communication that many people in a large number of countries all over the world, gain awareness related to each other’s customs and tend to admire each other’s lifestyle and culture. It progresses the activity of being integrated and tolerant with respect to each other.

• **Discussion:** The processes of debating and discussing elucidate various perspectives on matters that are of interest to people. With the help of communication, the reasons for difference in opinions and imparting of new ideas to others can be pinpointed.

### 2.2.4 Components of Communication Process

Communication as a two-way process involving interaction between two or more persons (on giving and receiving ends) is carried out in a cycle.

We may notice the presence of six main components or elements in general in any process of communication. The six components are given as follows:

![Fig. 2.1 Process of Communication](image-url)

**The Source of Communication (The Communicator)**

The process of communication essentially starts with a source of communication. There must be somebody to initiate the process. This source, whether in the form of some object/event or person, must be in a position to transmit information,
ideas, thoughts, opinions, feelings, etc. known or possessed by it with the other
person or persons on the receiving end of the communication. It is generally named
as ‘sender’ in the language of communication technology. In the teaching-learning
process going on inside the classroom, the teacher is regarded as the sender of
message whereas in any other communication or communication situation any
source of knowledge (man or material) can be regarded as the source of
communication.

A communication’s effectiveness very much depends upon the strength and
qualities of its source. As a student, you must have noticed that while some of your
teachers are able to prove themselves as an effective source of communication,
the others fail in such. What strength and qualities have you noticed in the successful
communicators? Some of these may be (i) their proper knowledge of the subject
matter, content or field of information, (ii) your own confidence in their knowledge
and stock of information, (iii) their name and fame (credibility) as good teachers,
(iv) their way of communicating and interacting with you, and (v) the impact of
their overall behaviour and personality. In this way, the personality characteristics,
and potential in terms of the content and presentation of communication count
very much for the effectiveness of a person as a communicator. The teachers,
lawyers’ political and religious leaders, writers, actors, artists or any others who
want to communicate their feelings, thoughts and ideas thus always try to imbibe
all the essential virtues and qualities of an effective communicator.

An actor, actress or model dresses himself or herself in a way that may
make him or her effective source of attraction. They give proper attention to their
physical and mental health and many other observable personality traits to make
them as the most appealing, attractive and acceptable source of communication.
Afterwards, they try to say or show whatever is desired from them according to
their roles and needs of the situation. If they are able to do so effectively, the
purpose of their communication may be properly served, otherwise their name
and reputation as a communicator get lowered day by day. A successful political
leader may drift the opinion of the masses within no time in his favour through the
magnetization effects of his personality, and by way of his communication. So is
true with your teachers. A teacher proving as an effective source of communication
may take you long with her/him quite effectively on the path of teaching – learning,
take active part in acquiring the learning experiences and be able to achieve the
desired learning objectives at your satisfaction. This is what a process of good
communication aims to achieve and it can happen only through the presence of a
proper communicator.

Contents of Communication or Massage/Communication Material

What is intended to be communicated or transmitted by the source, i.e. sender,
from his own stock of knowledge, information, thoughts, opinions, feelings, etc to
the other person or persons (receivers) is known as the contents of communication.
These may be well organized and structured or unorganized and unstructured or
spontaneous depending on the nature and purpose of communication and the media chosen or situation prevalent at the time of communication.

The effectiveness of a communication process in any classroom situation very much depends on the quality and nature of the communication material. If the content and message has some attraction, force and value to the receiver, it will surely catch his attention and make him quite attentive and an active participant in the communication process. On the contrary, if there is nothing new, novel or valuable in the message, i.e. the piece of instruction imparted by the teacher, it will neither attract nor motivate the students to take genuine interest for becoming active partner in the ongoing classroom communication. Therefore, it is the prime duty of all the communicators to think seriously about the quality and nature of the content material and the message given to the receivers. As far as possible, it should be quite relevant to their needs, interests, previous background, mental horizon and communication level. In brief, if there lays strength and effectiveness in the communication material, it will automatically penetrate into the eyes and ears of the receivers for the meaningful interpretation, understanding and responses on their part.

Media and Channel of Communication

What one wishes to convey to others is always communicated with the help of appropriate media or channel. The media in general takes the two distinctive forms-verbal (spoken or written words) and non-verbal (gestures, sign language, body language, morse code, etc.). In a communication process, both the sender and receiver are forced to make use of the media or channel of communication that is mutually acceptable as well as effective.

At the onset of any communication process, when one as a source of the message tries to convey some information or own ideas, thoughts and feelings, he is in fact motivated to transmit it to the receiver. For this, he first tries to organize the Communication Material in proper shape and then searchers for an appropriate media, verbal or non-verbal.

He has to make use of a special transfer mechanism known as encoding (transfer of thoughts and feelings into widely accepted, agreeable and understandable verbal or nonverbal signs and symbols). For example, when one tries to convey his displeasure about something, he may use the distinctive language such as ‘I don’t like this’ ‘don’t do this’ or express it through non-verbal gestures and body movements. Further, for the actual physical transmission of this symbolic expression, he may use a variety of channels. These channels of transmission are in fact nothing but the media or means which call for the use of our senses of sight, hearing, touch, taste, and smell. According to the demands of the situation and the effectiveness of communication, one may plan for the use of the appropriate verbal or non-verbal symbolism and sensory channel.

The intended encoded message travelling through the sensory channel then can move to the receiver. As it is encoded in a symbolic language, the receiver has
to resort to its decoding for understanding its meaning, in the way as intended by
the communicator.

The receiver after receiving the message then tries to respond. He now
takes initiative for opening the channel of communication with the source. For
transmitting his response or providing feedback, he also takes the help of encoding
his response in the non-verbal or verbal symbols. This encoded response is then
travelled through the sensory channels and reaches the sources which further decode
it for getting the needed feedback for maintaining the desired flow of communication
between him and the receiver.

The communication media or channel just lies in between the source and
the receiver like a bridge or connecting link. What the source of communication
says or shows to the receivers, can be done only with the help of some or the
other verbal or non-verbal communication channel. The nature and quality of the
traffic flowing on the bridge is very much dependent on the appropriateness,
strength and quality of the bridge. Similarly, the effectiveness and the strength of
the communication flow between the communicator and receiver surely depend
upon the nature and quality of the verbal and non-verbal means, and the media
and channels employed in the process of communication. For this purpose, the
following things should always be kept in mind.

- Use the language that is quite known and understandable on the part of
  the receivers.
- The verbal means should be supported by the non-verbal clues, gestures,
  body language, physical movements, etc. for giving the required strength
  and effectiveness to the process of communication.
- To reduce the ill effects of verbalism, attempts should be made to make
  use of audio visual aid material and appliance suiting to the very nature
  and timings of the communication.
- The essential skills should be learnt well both by the communicators and
  the receivers for drawing the maximum advantage through the
  communication.
- As a communicator you never use that media or means for the
  communication that is not capable of conveying what is intended by
  you. It should always be within the reach and comprehension of the
  receivers so that the chain of proper encoding and decoding can be
  continuously maintained.
- Have variety, novelty and creativity in making use of different means
  and media for the communication. Always prefer the multimedia approach
  over the single or the limited.

Receiver of the Communication

The receiver is the person who remains at the receiving end of the communication.
He is to receive the encoded intended message of the source of communication,
decode it for its proper interpretation and react or produce a desired response (feedback) to the source. In this way, the receiver like a far end pole is equally important for the flow of the current of communication between him and the communicator or the sender of the message. The communication can remain operative only if the receiver is interested and possesses the required competency to decoding, interpretation and understanding) in order to maintain the flow of communication.

The effectiveness in the flow is dependent much upon the quality and effectiveness of the contents. It is through feedback that one may evaluate the outcomes of his communication, i.e. what was intended to be communicated, it if has or has not reached the receiver, has there been any gap in the communication process, has there been any difficulty or misgiving in the interpretation of the message, etc. Thus, the quality of communication as a two-way process may thus be properly maintained through a proper feedback from the receiver and its subsequent follow up on the part of the sender.

Where the initiator or the source of communication is the communicator, the receiver lies on the other end for actualizing the process of communication. Actually, what is done through communication is always intended for the benefit of the receiver. A communication can only be carried out effectively with his active involvement and cooperation. In case he is not interested or not capable of receiving and understanding the meaning of the message or does not respond in a proper way for maintaining the flow of communication, the communication will turn into one-sided affair and thus lose its purpose and significance. In this way, the actual key of effective classroom communication lies with the receiver. If he has the characteristics of a good receiver, he may rise to the occasion for making the communication efforts of the communicator most fruitful and commendable in spite of the slackness, deficiencies and hurdles in terms of the use of proper media and channel of communication. These characteristics may be summarized as given below:

- The receivers must have sufficient previous knowledge and general background for receiving and understanding the communicated message.
- They must have the required proficiency and abilities in terms of communication skills such as listening, observing, reading, writing, speaking, mapping, drawing, measuring, surveying, thinking, analysing, synthesizing, evaluating and drawing inferences.
- They must have the skill and potential required for the use of various modes, media and means of communication. Their sense organs should be well adapted to the use of various audio-visual aid material and appliances.
- They must remain quite alert and attentive for receiving the intended message and provide essential response for giving the required feedback to the communicator for carrying out the chain of communication.
They must show proper zeal, enthusiasm, curiosity as well as need for maintaining the chain of communication.

They must not put themselves into a passive recipient of the information or message given by the communicator but should make themselves enquirers and active partners in the process of communication.

Check Your Progress
1. List any two characteristics of communication.
2. What is media or channel of communication?

2.3 TYPES OF COMMUNICATION

Human beings communicate in many different ways for achieving different results. Sometimes human beings do not feel the need of another person to perform the act of communication. People generally talk to each other or write letters and books to talk about various issues and subjects. There are also situations where people talk to each other in groups as in the case of business meetings or classrooms. There are acts of communication where one person talks to many, where it is not easy to get or understand the response or feedback of the audience.

In this section, we would discuss various kinds of communication so that the complete range of human communication could be described. The story of human communication begins with intrapersonal communication and then we find interpersonal, group and mass communication as other kinds that relate to the growth of society.

2.3.1 Intrapersonal Communication

Human beings have the gift of language which helps them to communicate with each other. The same system of language has given them the facility to talk to themselves. The whole process of thinking in human beings can be considered as communicating to themselves. This kind of communication is called intrapersonal or auto-communication. Intrapersonal communication is in fact a reflexive process which is very significant for thinking, conceptualizing and formulating ideas before they could be used for other types of communication.

There are many examples of interpersonal communication in our daily life. For example, we often come across monologues in literature, especially in drama and we also find people indulging in laud thinking. The tendency of laud thinking becomes abnormal when it almost becomes a habit. In many societies people talk to themselves in public as they are either very tense or they feel alienated.

In fact, if we look at interpersonal communication from the time life occurred on earth, we could observe that all living mechanisms starting from amoeba have
the need to talk to themselves for their very existence. In this sense all physio-
cerebral communications could be viewed as intrapersonal communication.
However, in communication studies we only include human communication that
takes place with the help of some kind of sign system like language.

Dream is one such communication which is very common where one does
not only uses the language in the form of dialogues with the characters one sees in
the dream, but a large part of dream is made up of series of visuals like a film that
we have recorded in our brain in the conscious state.

2.3.2 Interpersonal Communication

Interpersonal communication is the most usual form of communication. In every
society individuals indulge in various kinds of social relationships that could not be
sustained without talking to each other. It is to establish this link between them that
human beings, in a way, invented language system that uses jaws and vocal cords
to articulate signals that could be transmitted to the ear which then decode it to get
the meaning.

As interpersonal communication takes place between two or more persons
when they are present at a given place at a given time, it is not only the language
that communicates, even the facial expression, gestures, postures, hair styles, dress,
etc., become potent source of information. In fact, human beings have been using
all their five senses to receive different kinds of information available around them.
These senses keep working all the time in the conscious state of mind. The
conversation that you have every day with your family members is a kind of
interpersonal communication.

Starting from our primitive days of existence, interpersonal communication
has become the backbone of all human development. Even in this age of heightened
literacy the significance of interpersonal communication has not diminished because
it is the only form of communication that is very natural and allows people to have
the immediate feedback of the messages transmitted by them.

The proximity between the people involved in communication also evokes
a certain emotivity which in turns helps them to encourage, motivate, influence
and persuade people. It also helps them to effectively coordinate their activities
and works. It is difficult to imagine the absence of interpersonal communication in
societies as a large part of human activity is such which involves people doing
things together. For example, construction of buildings would become impossible
if people could not communicate because construction is a group activity.

2.3.3 Group Communication

In a way any communication between more than two persons can be seen as a
group communication, but any communicative situation in a family or friends is
generally seen as interpersonal communication because these are not always
intentional or organized. Hence, we can say that group communications occurs
when people gather intentionally or when an act of communication in group is organized with a particular objective in mind.

Group communication has been there since the human societies moved out of the wildlife state to organize them into tribes. In fact, the transition of homosapiens from individual families to tribes may be seen as the beginning of social organization where communication started playing a major role as they found a higher form of communication than its earlier form of interpersonal communication. One could recall the newer forms of odes, folk songs and storytelling devised by tribal societies to perpetuate their traditions and to glorify their ancestor heroes.

In the later days of human civilization, we find the religious gatherings like prayer meetings, educational endeavours, public or private court meetings of kings and public meetings in modern democracies as the newer forms of group communication. In modern times, individual family business or multinational corporate business, national governance and international relations cannot be imagined without various forms of group communications. The meeting of the board of governors, the parliament sessions, the group of ministers’ meetings, national and international conferences, and conventions and summits are all examples of group communication. In our daily lives, when we are sitting with our family and sharing our everyday experiences and opinions about life, we are involved in group communication. Also, a group of friends chatting is also a form of group communication.

The sitting arrangements for group communication have their own significations. Podium and audience arrangement generally does not allow two way communications; it would normally be useful for top-down communication. Board meeting arrangement of round table conferences on the other hand allows an equal level two-way dialogue between the groups.

2.3.4 Mass Communication

Mass communication is not merely an extension of group communication, it also involves heterogeneous masses. What makes interpersonal and group communication similar to each other is the homogeneity of the audiences. People involved in such communication not only share the code of communication, they by and large share thought process, culture and attitudes too. The feedback process of these types of communication is also different as the feedback is immediate in interpersonal and mass communication, whereas the feedback is delayed and more complex in mass communication as different type of mass media are used for transmitting the messages to masses.

*Handbook of Journalism and Mass Communication* defines mass communication as ‘a process of delivering information, ideas and attitudes to a sizable and diversified audience through use of media developed for that purpose.’ Mass communication is a one-way communication in the sense that it is one-to-many kind of communication whereas interpersonal communication is most of the
times one-to-one communication. What makes mass communication interesting and challenging is the very fact that it is one-to-many type of communication where the sender may think or pretend knowing his/her audience but is never sure to whom all he/she is communicating. The challenge of mass communication alone has forced people concerned or involved in it to study the nature, attitudes, demography, etc., of the audience as scientifically as possible. The shift of journalism studies from language departments to independent interdisciplinary discipline is a result of the complexities of mass communication.

The role of mass media is very significant in a society. Harold Lasswell, a prolific communication scholar, suggested that the media perform four basic functions for society: surveying the environment to provide information; correlating response to this information (editorial function); entertaining the media user (diversion function); and transmitting the country’s cultural heritage to future generations (socialization or educational function). In a developing country, the mass media are also expected to play an additional role – to mobilize public support for national development.

2.3.5 Small Group Sharing Information and Large Group Sharing Information

Information sharing is the sharing of common experiences with others. Sharing of an idea, thought, feeling or information with others, which includes thinking, dreaming, speaking, arguing and so on is sharing information. Sharing information has a very wide scope. Sharing information is a skill as it involves certain fundamental techniques, it is an art as it involves creative challenges, and it is science because certain verifiable principles are involved in making sharing information more effective. All this makes sharing information a complex process.

**Group information sharing or large group information sharing:** In this type of information sharing, the members of a group interact with each other. A group is a collection of people who have common interests. Discussions in a workshop, a seminar, or a family are examples of group information sharing. Group information sharing is used to take a collective decision on a problem, an issue or a matter of common concern. The participants involved in group information sharing take active part in information sharing to achieve a set of goals, to develop social contacts or to find the solution to a problem faced by the group. The family, a section in an office, and a classroom are examples of group information sharing systems.

**Organizational information sharing:** It is that information sharing which revolves around one organization. Since an organization consists of groups of individuals, it can be said to be multiple group information sharing system having interaction with each other. Information sharing may start from any point in the organization. For instance, information sharing takes place in schools, industries, offices and other institutions. Notifications are normally used as means of information sharing in such an organizational information sharing system.
Information sharing among masses: Mass information sharing involves more than two persons but it goes beyond group and organizational information sharing. As the term ‘mass’ indicates, this type of information sharing always concerns a large number of people sharing information, ideas, thoughts and so forth. In this case, we use the mass media to communicate with a large number of people. In mass information sharing we include face-to-face, as well as, print and non-print information sharing. For example, the radio and television programmes are broadcast to educate, inform or entertain a large number of people. Information sharing among masses has three characteristics. We will discuss them briefly here.

(i) The audience is large and heterogeneous: You know that radio and television, being mass information sharing media, have a large audience with different backgrounds, tastes, ages, occupations and other aspects. Both the illiterate and the literate can make use of these media. Newspapers, another mass medium, have a comparatively smaller audience.

(ii) The source is an institution or a group of people: For example, the Ministry of Information and Broadcasting, Government of India, is engaged in broadcasting television and radio programmes all over the country. The Times of India group, is one of the private institutions engaged in printed mass information sharing in India.

(iii) Some kind of mechanism is used to reproduce information: The mechanism could be the printing press, programme production studio, transmitters, the TV and the radio receivers and so forth.

Check Your Progress

3. Give examples of interpersonal communication in our daily life.
4. List the main characteristics of information sharing among masses.

2.4 BARRIERS TO COMMUNICATION

Barriers to communication have made the process complex, difficult and frustrating. Communication is effective if it flows freely through an appropriate medium between the sender and the receiver. Free flow means uninterrupted transmission of information or message, correct comprehension of the message by the receiver, and relevant and appropriate feedback from him. Problems with any one of the components of communication can become a barrier to communication. Barriers to communications range from simple distracting noises to complex psychological factors. These barriers may cause simple communication gaps or total failure of communication. Some major barriers of communication are as follows:

(i) Lack of common language: Language uses oral or written symbols to transmit messages from one person to another. If the sender and the receiver
of a message do not belong to the same language group, then this deficiency will pose as an obstacle to the process of communication. The sender and the receiver will not be able to communicate with each other if they do not know a common language. Communication will not be possible between a boy who can only speak in English and another boy who can only speak in French.

(ii) **Semantic barrier:** It is possible for one word to have many different meanings. It is not necessary for the meaning that is ascribed to a word by the communicator to be the same as that ascribed by the receiver to the same word. One word can have different meaning for different people at different points of time. Hence, it is possible that the sender and the receiver, most of the time, ascribe different meanings to the same word. Occasionally, they might possibly make use of dissimilar words to communicate the same meaning.

(iii) **Poor listening:** Poor listening skills are one of the chief problems when communicating. If people are attentive in listening to the message, a lot of misunderstanding can be reduced. A large number of people do not pay value added attention to the message because of a variety of disturbances, feelings, enthusiasm, absence of interest, unwarranted assertiveness and roving concentration. This usually leads to misunderstanding and conflict.

(iv) **Poor vocabulary:** Low level of vocabulary is an obstacle to the communicator in conveying the message in its exact form. It makes the message more complicated and reduces its effectiveness. If the recipient cannot figure out the words, he will not be able to comprehend the sentences.

(v) **Noise:** A lot of noise also affects communication. Noise is usually, but not always, in the form of sounds. It can be visual, audio-visual, written, physical or psychological. Noise, in a physical form denotes the loud noise made by machines or speaker or other such things. Noise occurs when a student arrives late for a class and his arrival becomes a source of distraction for others in that class. Bad handwriting and incorrect typing leads to written noise. Psychological noise refers to mental trouble and turmoil, inattentiveness and indifference.

(vi) **Time:** Time factor may also hinder the process of communication. For example, a phone call at midnight may irritate the receiver and he may not listen to the communicator. Thus, his communication becomes ineffective. The best of communication may prove to be ineffective if it does not take place at the right time.

(vii) **Distance:** The distance between one who communicates the message and one who receives it may be a strong obstacle to communication. This can be due to absence of technical equipment such as telephone, telefax, etc., for linking them. An unfavourable system of seating in the classroom can...
give rise to a type of communication gap, which can be eradicated by making adjustments in the distance.

(viii) **Attitudes and values**: People interpret message on the basis of their attitudes and values. If a message is adverse for the receiver, it will not be able to persuade him easily. Thus, personal attitudes, values and opinions are transformed into obstacles, in the process of effective communication. Negative attitude of a teacher or a student may affect communication in the classroom.

(ix) **Emotional barrier**: Emotions refer to the way we feel about the world around us. Constructive emotions like happiness, adoration or liking make the flow of communication smooth. However, negative emotions like fear, distrust, anger, anxiety and hatred, work as powerful hindrances to efficient means of communicating.

(x) **Different perceptions**: Different perceptions of different people have their own limitations. According to Francis Bacon, ‘man prefers to believe what he prefers to be true’. Our reality is created by us with the help of selective perception. This conceals specific things that are present and reveals other more specific things, in addition to those which are already present. Every person’s experience and his way of interpreting things are never the same since every person has perception his own. A communication barrier emerges, when the same object or concept is interpreted differently by two or more people.

(xi) **Wrong channel**: At times, simple rules for selection of a channel cause more problems than they solve. In selection of a channel, the sender needs to be sensitive to things like complexity of message, consequences of a misunderstanding, knowledge, skills and abilities of the receiver and timely response on receiving the message.

(xii) **Poor retention**: There is a limit to the functioning of human memory. Everything that is said cannot be always retained. The retention is even lower if the receiver is not interested or attentive. This causes a breakdown in the process of communication.

(xiii) **Closed mindedness**: It is not at all easy to communicate with a person with intense prejudice. This type of a person is not ready to receive any message on a subject about which he believes that he knows everything. His mind is closed to new ideas, facts and proposals. Hence, he completely rejects the information and recommendations of the communicator, even before he knows the real facts.

(xiv) **Physical distractions**: Physical distractions are physical things that interrupt communication. For example, uncomfortable seating arrangement makes it difficult for a learner to concentrate on the communication.
Lack of proper feedback: Without feedback, communication is one-way. Feedback in terms of proper motivation, incentives, zeal and enthusiasm is needed on the part of the sender and the receiver. If, in a classroom the teacher is not getting feedback of his teaching, he may never achieve the actual goal of teaching.

Too much information: Excess of information also acts as communication barrier. A lot of information faces many drawbacks and different respondents react differently to filter the information and receive only what they need. Hence for effective communication, the amount of information can be reduced.

Check Your Progress
5. How does noise act as a barrier to communication?
6. How does lack of proper feedback act as a barrier to communication?

2.5 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. Two characteristics of communication are the following:
   i. Purposeful: Communication always involves a purpose. Whenever an idea or thought arises in the mind of a sender, he wants to communicate it. This means there is always some purpose behind it.
   ii. Universal: Communication is the only way through which human beings can share information. Thus, communication is a universal process as it occurs almost everywhere.

2. In a communication process, both the sender and receiver are forced to make use of the media or channel of communication that is mutually acceptable as well as effective.

3. There are many examples of interpersonal communication in our daily life. For example, we often come across monologues in literature, especially in drama and we also find people indulging in laud thinking. Dream is one such communication which is very common where one does not only uses the language in the form of dialogues with the characters one sees in the dream.

4. The main characteristics of information sharing among masses are the following:
   i. The audience is large and heterogeneous
   ii. The source is an institution or a group of people
   iii. Some kind of mechanism is used to reproduce information
5. A lot of noise acts as a barrier to communication. Noise is usually, but not always, in the form of sounds. Noise occurs when a student arrives late for a class and his arrival becomes a source of distraction for others in that class. Bad handwriting and incorrect typing leads to written noise. Psychological noise refers to mental trouble and turmoil, inattentiveness and indifference.

6. Without feedback, communication is one-way. Feedback in terms of proper motivation, incentives, zeal and enthusiasm is needed on the part of the sender and the receiver. If, in a classroom the teacher is not getting feedback of his teaching, he may never achieve the actual goal of teaching, thus, making the communication process ineffective.

### 2.6 SUMMARY

- Man is a social animal and his ability to communicate is the prime factor that distinguishes him from other animals. Apart from basic necessities, one needs to be equipped with good communication skills.
- Communication is must as it involves transmission of message by a sender and its proper understanding by the receiver.
- Effective communication is important because it allows people to lead more satisfying lives.
- Communication as a two-way process involving interaction between two or more persons (on giving and receiving ends) is carried out in a cycle.
- The process of communication essentially starts with a source of communication. There must be somebody to initiate the process. This source, whether in the form of some object/event or person, must be in a position to transmit information, ideas, thoughts, opinions, feelings, etc.
- What is intended to be communicated or transmitted by the source, i.e. sender, from his own stock of knowledge, information, thoughts, opinions, feelings, etc to the other person or persons (receivers) is known as the contents of communication.
- In a communication process, both the sender and receiver are forced to make use of the media or channel of communication that is mutually acceptable as well as effective.
- The receiver is the person who remains at the receiving end of the communication. He is to receive the encoded intended message of the source of communication, decode it for its proper interpretation and react or produce a desired response (feedback) to the source.
- Interpersonal communication is the most usual form of communication. In every society individuals indulge in various kinds of social relationships that could not be sustained without talking to each other.
Group communication has been there since the human societies moved out of the wildlife state to organize them into tribes. In fact, the transition of homosapiens from individual families to tribes may be seen as the beginning of social organization where communication started playing a major role as they found a higher form of communication than its earlier form of interpersonal communication.

Mass communication is not merely an extension of group communication, it also involves heterogeneous masses. What makes interpersonal and group communication similar to each other is the homogeneity of the audiences.

Mass information sharing involves more than two persons but it goes beyond group and organizational information sharing. As the term ‘mass’ indicates, this type of information sharing always concerns a large number of people sharing information, ideas, thoughts and so forth.

Barriers to communication have made the process complex, difficult and frustrating. Communication is effective if it flows freely through an appropriate medium between the sender and the receiver.

Emotions refer to the way we feel about the world around us. Constructive emotions like happiness, adoration or liking make the flow of communication smooth. However, negative emotions like fear, distrust, anger, anxiety and hatred, work as powerful hindrances to efficient means of communicating.

2.7 KEY WORDS

- **Communication:** It is the transmission and understanding of message from sender to receiver.
- **Feedback:** It is an essential component of the communication process which makes the process successful.
- **Mass communication:** It is a process of transmitting messages to a large number of scattered audiences through the use of appropriate media.

2.8 SELF ASSESSMENT QUESTIONS AND EXERCISES

**Short Answer Questions**

1. What is the importance of communication?
2. Write short notes on the following:
   (a) Interpersonal communication
   (b) Small group and large group communication
3. Briefly mention the role of communication in education.
**Long Answer Questions**

1. ‘Communication is a complex and ongoing process.’ Explain the statement.
2. Discuss the process of communication with the help of a diagram.
3. Explain the various barriers to communication.

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**2.9 FURTHER READINGS**


UNIT 3  OVERCOMING BARRIERS

Structure
3.0 Introduction
3.1 Objectives
3.2 Methods of Communication
3.3 Media of Communication
3.4 Principles of Effective Classroom Communication
3.5 Verbal and Non-Verbal Communication
3.5.1 Important Modes of Non-Verbal Communication
3.6 Answers to Check Your Progress Questions
3.7 Summary
3.8 Key Words
3.9 Self Assessment Questions and Exercises
3.10 Further Readings

3.0 INTRODUCTION

Nowadays, we face various obstacles in the process of effective communication. The process of communication can be made effective by selecting the appropriate media and methods of communication. Even in classroom teaching, several principles have to be adhered in order to ensure effective classroom teaching. The way the teacher organizes the classroom should lead to a positive environment rather than a destructive and/or an environment that is not conducive to learning. Moreover, you will also get to study verbal communication and non-verbal communication in detail in this unit.

3.1 OBJECTIVES

After going through this unit, you will be able to:
- Discuss the methods of communication
- Explain the media of communication
- Describe the effective principles of classroom communication
- Differentiate between verbal and non-verbal communication

3.2 METHODS OF COMMUNICATION

Two modes of communication are used in teaching process: (i) Oral communication, and (ii) Written communication. The modes of communication are selected on the basis of learning objectives.
(i) **Oral communication strategy**: It implies speaking and listening communication channels. There is largely oral or verbal interaction in classroom teaching. This is based upon audio-lingual methods. The teacher has to speak orally and students have to listen to the oral communication. It requires content first and expression on the part of teacher and students listen the expression first than the theme or content.

The oral communication takes place between teacher and student with the help of speaking and listening operations as shown in the following diagram below:

![Diagram of Teacher and Student Interaction (Audio lingual Method)](image)

Oral communication strategy is classified into two sub-categories:

(a) **Continuous prose oral communication strategy**: It is the most simple, useful and general strategy of communication. This strategy is helpful in achieving the knowledge and comprehension objectives. Various facts and information can be imparted to the pupils by this strategy. Without this strategy no communication is possible. The words and sentences should be simple and easy. Programmed instruction is the example of continuous prose. The following precautions should be taken in this strategy:

- **Simple language**: The structure of the prose should be simple and easy.
- **Simple sentences**: Small and simple sentences should be used for explaining the complex concepts and facts.
- **No compound sentences**: Compound sentences should not be used.
- **No negative sentences**: The use of negative sentences should be avoided.
- **Active voice**: The sentences should be in active voice.

(b) **Heuristic oral communication strategy**: Polya and Dunker used this communication strategy for solving problems. It makes use of trial and error method or heuristic process. It is an experimental method.
In it, discovery is made on the basis of alertness. This strategy is effectively used for problem-solving learning but sometimes wrong solutions are accepted.

The following precautions should be taken in using this strategy:

- **Several outcomes**: There may be several expected outcomes.
- **Several interactions**: There may be several expected interactions.
- **No definite structure**: The structure of content is not definite.

(ii) **Written communication strategy**: Whereas oral communication does not ensure the solution of the problem, written communication ensures the correct solution of the problem. Written communication is based upon the cognitive mode of method of teaching. An interaction between teacher and student takes place through reading and writing activities as shown in the following diagram:

![Diagram of Teacher and Taught Interaction (Cognitive Code Method)](image)

In writing, content comes first than expression and sequence is reverse in reading activities. Generally, communication is performed with the help of four activities: speaking and listening, writing and reading. It may be classified in two sub-categories:

(a) **Algorithms written communication strategy**: This strategy was developed by Watson and Jones in the London University. Algorithms are awards from Arabian language. This communication is used in mathematics. The strategy can be used easily and effectively by students, trainees and teachers in solving the problems. It is an economical and the task becomes easy to handle. The following are the main objectives of this strategy:

- **Chain learning**: It develops the chain learning.
- **Reasoning abilities**: It develops reasoning abilities.
Overcoming Barriers

NOTES

Self-Instructional Material

- **Diagnosis and remediation**: The student’s weaknesses are diagnosed and remediation is provided side by side.
- **Realizing objectives**: The teaching objectives are effectively realized.

(b) **Decision table written communication strategy**: Decision tables are also called as logic tables. This strategy was developed by Grad in 1961 and now it is used in computer-associated instruction. Packer and Davies have suggested its use in teaching process as a communication strategy. Decision tables are used in problem solving, question-answer and in providing information. When the students compare their answers with the correct answers and they find them correct, they feel pleasure. It provides them reinforcement. The wrong responses are used to diagnose the students’ weaknesses. When these decision tables can help to establish cause and affect relationships by defining the problems, between the directions and tasks on one side, these are also successful in interpreting completely each event. This avoids any fear of error. Since the decision tables prove useful in expressing complex rules successfully therefore, in modern age these should be used as a teaching strategy. This strategy has the following characteristics:
  - **Minimum errors**: The whole description is presented in such a way that student should commit the minimum errors.
  - **Cause-effect relationship**: The problem is defined by some assistance and cause-effect relationship is explained clearly.
  - **Use in computer-assisted instruction**: This strategy is used in computer-assisted instruction.
  - **Use in teaching process**: The strategy is used also in teaching process.
  - **Improvement**: This can be improved and changed on the basis of empirical evidence.
  - **Sources of errors**: Sources of errors are also considered.
  - **Reducing the complexity**: The designed form of decision table communication is based upon information, but the earlier weaknesses are kept in view and complexity of the problem is reduced.

3.3 **MEDIA OF COMMUNICATION**

The effectiveness of the communication is dependent on the type and nature of the media. Therefore, the selection of media becomes very important as far as efficiency and effectiveness are concerned. The sender must select a suitable medium to
transmit his message, else the intended receiver may not get it. This selection of the communication medium varies depending upon the features of communication. Various types of media used in the process of communication are as under:

(i) **Audio media:** When only verbal mode is used for communication, the media used is known as ‘audio media’. In this media, communication is possible by using sound. Both, the communicator and receiver may rely only on the audio media. For example, communication through radio, tape recorder, etc., also provides examples of audio media. It is a type of oral communication.

(ii) **Visual media:** Sometimes the receiver sees or reads information. For example, in a classroom a learner may receive information by reading out a written or printed statement, or through visual interpretation of the material in the form of chart, graph or diagram. Communication through newspapers, magazines, books, dictionaries, etc., provide information through visual media.

(iii) **Audio-visual media:** Combination of audio and visual media is the most common form of communication in a classroom. A teacher uses the skill of narration, explanation, lecturing, questioning and exposition; along with writing on the blackboard, drawing a diagram, displaying a model and demonstrating an experiment. Audio-visual media is much more effective than separate use of only audio or video media for communication.

(iv) **Mass media:** Mass media is any medium used to transmit mass communication. Radio, television, video, cinema, printed media like books, newspaper and magazines, the Internet, teleconferencing, satellite communication and transmission all come in the category of mass communication. Online education and correspondence courses run by many institution make use of mass media in a formal and organized way.

(v) **Multimedia:** Multimedia involves use of varied media types (text, images, speech, audio and video) in a planned and organized way for deriving the maximum output. A good teacher seeks as many ways as possible to present information and ideas to students, to stimulate their thinking. The use of multimedia is most for this purpose. Many open universities use multimedia strategy in delivery of their courses and provide access to learning resources through print, audio, video and the web.

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**Check Your Progress**

1. List the precautions to be taken while using the heuristic oral communication strategy.
2. Who developed the Decision table written communication strategy? How does it function?
3. Give examples of mass media.
3.4 PRINCIPLES OF EFFECTIVE CLASS ROOM COMMUNICATION

NOTES

Effective communication is essential requirement for the success of teaching-learning process. Therefore, for all practical purpose, the teacher should invariably try for achieving utmost efficiency and effectiveness in the process of classroom communication and interaction with the students. Effectiveness in the classroom communication depends upon (1) the strength and qualities of source of communication, (2) the quality and nature of communication material (content), (3) the channel or communication media (verbal and non-verbal), (4) the strength and qualities of the students and (5) environmental conditions and situations. Therefore, for achieving effectiveness in class-room communication necessary improvement should be made with regard to the contribution of each factor/component related with the process and mechanism of classroom communication.

1. Sender (Source): Effectiveness in the classroom communication to a great extent depends upon the strength and qualities of the sender or source. Therefore, all teachers should try to imbibe the virtues and qualities of an effective sender or sender of the message. The following characteristics or qualities of communicator/teacher are helpful in achieving effectiveness in classroom communication:
   - Up-to-date knowledge and mastery over the subject matter or content delivered to the students.
   - Thirst for knowledge.
   - Efficiency in appropriate selection and application of learning material.
   - Efficiency in the use of appropriate techniques, device, maxims and principles of teaching.
   - Efficiency with regard to thinking skills like ability to think, reason, imagine, concentrate, analyses, synthesize, judge and generalize.
   - Efficiency in expression skills like ability to explain, expose, narrate, describe, demonstrate and prepare software for the communication of ideas.
   - Efficiency in the use of language with appropriate voice and pronunciation.
   - Efficiency with regard to appropriate: use of audio-visual aids, multimedia and channels of communication;
   - Efficiency in class control and management.
   - Efficiency in understanding the learner and his aim.
   - Good physical, mental and emotional health.
   - High intellect, character and social effectiveness.
   - Dedication and love for teaching profession as well as for students.
• Self-confidence, enthusiasm, industriousness, impartiality, optimistic, democratic, progressive, sympathetic, loving, and psychological outlook.
• Teacher like dress and management.
• Teacher like behavior in dealing with the student.
• Balanced personality

2. Communication material (content or message): The success and effectiveness of the communication process in any classroom situation also depends upon the quality and nature of the communication material, i.e., the content or message. The strength and effectiveness in the communication material penetrates into the eyes and ears of the receivers (students) for the meaningful understanding and interpretation. Relevancy of the content to the previous background, needs, interests, and mental horizon of the students (pupil-centre content) facilitate effective classroom communication.

3. Communication media or channel: Besides source and content, effectiveness of classroom communication also depends upon the nature and quality of media or channel, i.e., verbal and non-verbal means.

(a) Verbal means: Effective communication depends upon the effective use of verbal means like (i) Oral communication including talks, lectures, discussions, storytelling narration, description, telephonic conversation, radio broadcast, and recording, (ii) Visual communication including pictures, posters, charts, maps, slides, and film strips, (iii) Oral-visual communication including television and films, and (iv) Written communication including books, booklets, pamphlets, magazines, and newspapers.

(b) Non-verbal means: Effective communication in the classroom also depends upon the appropriate use of non-verbal means like facial expressions, eye contact, body postures, gestures, and conversational silences.

The following points should be specifically kept in mind while using verbal and non-verbal means:
• Use known and understandable language.
• Support verbal means by the appropriate use of non-verbal clues like facial expressions, eye contact, body postures, gestures, and conversational silences for increasing the effectiveness of classroom communication.
• Use appropriate audio-visual material for the negative effect of verbalism.
• Develop required essential skills for the effective use of communication.
• Always use the communication media or means which are within reach and comprehension of the students (receivers).
• Always prefer the multi-media approach to the single or the limited usual means. Use variety, novelty and creativity while adopting different media or means for communicating the message.

4. **Receiver of communication:** In fact, all communication is meant for the benefit of the receivers. The real key of the effective classroom communication lies with the receivers. Effectiveness in classroom communication is highly influenced by the important characteristics of receivers like the following:
   (i) Adequate previous knowledge and background for understanding the communicated message.
   (ii) Required proficiency and abilities in terms of communication skills like reading, writing, speaking, listening, observing, questioning, thinking, reasoning, analysing, and synthesizing, summarizing, evaluating and drawing inferences.
   (iii) Required proficiency and abilities for the use of various modes (media) of communication.
   (iv) Concentration, alertness, activeness and willingness to information.
   (v) Sufficient curiosity, enthusiasm, zeal and need for maintaining the chain of communication.
   (vi) Ability to give and receive immediate feedback as true communication is achieved through potent and insistent feedback.

5. **Environmental conditions and situations:** The effectiveness and success of classroom communication also depends upon appropriate environmental conditions and situations. The physical and psychological factors involved in the environmental conditions and situations influence the efficiency and effectiveness of the teacher (source), students (receivers) and media or channel of communication. Therefore all possible efforts should be made for making necessary improvement in the environmental conditions and situations of the classroom communication by adopting the following measures:
   (i) **Location of classroom:** The classroom should be situated as not to be affected by the outside disturbances like noise.
   (ii) **Spacious classroom:** The classroom should be sufficiently spacious as to accommodate the required number of students with the seating capacity norms. There should be sufficient ventilation, light and seating arrangement as well as space for instructional and communication activities.
   (iii) **Time-table and disciplinary conditions:** Internal arrangements, time-table and disciplinary conditions should also be controlled in such a way as not to provide any barrier to the class-room communication.
(iv) Audio-visual material: The classrooms should have adequate arrangement for the use of audio-visual material required for the effective classroom communication.

(v) Motivation and encouragement: The teachers should make adequate efforts for encouraging, attracting and motivating the students for the required class-room communication. They should make best possible efforts for removing the communication difficulties and deficiencies by adopting sympathetic and affectionate attitude towards the students.

(vi) Socio-psychological environment: The principles of group behaviour, group dynamics and socio-psychological climate should be kept in mind for having a favourable socio-psychological communication environment, during the classroom communication and interaction, socio-psychological environment should be maintained.

(vii) Healthy interaction: Unhealthy criticism, negative and discouraging remarks on the part of teachers and in disciplined behavioural responses of the students should be properly checked and controlled as not to provide any barrier for the effective classroom communication. Best possible efforts should be made to have healthy and useful interaction between the teacher and students and among students and students during the class-room communication.

3.5 VERBAL AND NON-VERBAL COMMUNICATION

Let us study about verbal and non-verbal communication under this section.

Verbal Communication

Language is the key and the base of any verbal communication. Each society develops one or more forms of languages with spoken or written words for communicating with each other. Accordingly, we have local, regional, national and international language for the required communication. The basic units of any language are words and sentences which are governed by the rules of the grammar. Language can make use of one of the three forms: (i) oral, (ii) written (iii) oral and written. In the oral form, one can communicate one’s feelings, thoughts and intentions to others by the speaking and listening channel. For this purpose, the sender/communicator makes use of some precise and distinct sounds which when heard by the receiver, are decoded for understanding their meaning.

In the written form of language communication, the communicator/sender makes use of the script of the language such as Assamese for Assamese language, Devnagari for Hindi and Gurumukhi for Punjabi. For the communication of thoughts and feelings one writes about it through some written mode, pencil, paper or chalk, board or print media and the person at the receiving end understands the meaning of the communicated message through its reading and decoding.
In the usual classroom communication, a teacher while writing on the blackboard also makes use of language for the explanation and exposition of the written contents.

Non-Verbal Communication

The communication process can also be carried out without the use of any verbal means. In many cases, (such as communication with deaf and dumb, mentally retarded, the persons not knowing the language of the sender or sending a secret message in the commonly coded and symbolic expression), it may become a necessity as well as compulsion to make use of the non-verbal communication. In the normal situations also, the non-verbal media is generally used for giving strength and effectiveness to the verbal communication. Components of non-verbal communication are discussed as follows:

- Proxemics: The study of space in interpersonal communication.
- Chronemics: The study of time factor.
- Paralanguage: The study of voice quality and variety.
- Haptics: The study of touch.
- Oculistics: The study of eyes.
- Kinesics: The study of body language.

You will now be able to comprehend the various elements of non-verbal communication given in brief in the following paragraphs. An elaborate explanation of kinesics, however, is given in subsequent sections.

Proxemics

Proxemics is the study of perceptions of people on physical space and its use by them. Aggression is caused by power. Those who like to be powerful occupy larger space. Large office rooms, big cars, large tables and large quarters are high-status indicators.

Based on the concept of territory, Edward T. Hall developed proxemics during the 1950s. Hargie and Dickson (2004, p. 69) identified four types of territories as shown in Table 3.1.

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Primary territory</td>
<td>One's own area, entry to others with permission only, e.g., Own office cabin.</td>
</tr>
<tr>
<td>2</td>
<td>Secondary territory</td>
<td>No ‘right’ to occupancy, but routine use gives attachment, e.g., a seat in the bus usually occupied.</td>
</tr>
<tr>
<td>3</td>
<td>Public territory</td>
<td>Area, which is given to all, for sometime, e.g., parking space.</td>
</tr>
<tr>
<td>4</td>
<td>Interaction territory</td>
<td>Space created by others when they are interact.</td>
</tr>
</tbody>
</table>
Chronemics

Chronemics studies the use of time in non-verbal communication. Time is an important determinant of a person’s image.

*Punctuality:* If a person is punctual, he is rated efficient and organized. However, late coming is common in case of guests. Making people wait is considered a status symbol in their case.

*Speed of action:* The timing of an action is important. Dynamic managers make quick decisions and implement them fast. Participative managers take time to decide as it requires contribution by all participants. Some managers are slow in decision-making. It signifies conservative attitude or laziness of the decision maker.

*Frequency of an action:* If an individual is frequently absent, he or she is called chronic absentee, whereas if a person is absent now and then he/she is not labelled for this behaviour. Thus, frequency of an action is also an important factor in explaining behaviour.

Paralanguage

Also referred as *vocalics,* paralanguage is the study of non-verbal cues of the voice. These cues include the acoustic properties of speech, namely tone, pitch and accent, together called prosody. Paralanguage can emphasize or change the meaning of words.

A classification method that comprised the voice set, vocalization and voice qualities was advanced by George L. Trager. Table 3.2 shows the classification of voice system.

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Classification</th>
<th>Description</th>
<th>Elements</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Voice set</td>
<td>Context of speech</td>
<td>Situation, gender, mood, age and a person's culture.</td>
</tr>
<tr>
<td>2</td>
<td>Voice qualities</td>
<td>Which give each individual a unique voice print</td>
<td>Volume, nasality, tempo, resonance, rhythm, articulation, pitch and accent.</td>
</tr>
<tr>
<td>3</td>
<td>Vocalization</td>
<td>Characterizers</td>
<td>Emotions expressed while speaking like laughing, crying and yawning.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Voice qualifier</td>
<td>The style of sending a message, e.g., yelling.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vocal segregates</td>
<td>Such as ‘uh-huh’ to indicate listener is listening.</td>
</tr>
</tbody>
</table>

Haptics

The study of touching behaviour as non-verbal communication is known as haptics. Different touches are:

- **Handshakes:** Shaking hands to greet a person.
- **Kissing:** Lip touch on lip, cheek or hand top signal welcome or love.
• Slapping: Soft slap shows intimacy, hard slap shows anger.
• Patting: On the back, on the cheeks, etc., indicate appreciation.
• Scratching: Scratching head indicates doubt.

The background of the situation determines the meaning conveyed from a touch, including the way one is touched and the personal dynamics between communicators.

Oculesics
It refers to the role of eyes in non-verbal communication. Eye contact shows attention, interest, and involvement. Glancing indicates passing interest whereas gazing indicates intense interest. Staring is interpreted as anger or confusion. Blinking indicates ignorance.

Kinesics
The study of body movements, facial expressions and gestures is called kinesics. It is the non-verbal behaviour of the whole or part of the body. It examines and interprets behaviour, such as mutual gaze, smile, facial warmth or pleasantness, etc. Ray L. Birdwhistell, a ballet dancer who later on became an anthropologist, advanced this concept in the 1950s. He wanted to understand how people interact with gestures, stance, posture, etc. As phoneme is known as a unit of sound, kineme is the unit of body movement. However, many people prefer the term body language to denote kinesics.

3.5.1 Important Modes of Non-Verbal Communication

Facial Expression
Facial expression may very well communicate the feelings, thoughts and intentions of the communicator. In general, face and facial expressions may be said to be a true index of one’s emotional and thinking behaviour. When one is perturbed, his face gives the identity of the level of the anxiety and stress. Similarly, when one is in a happy or joyful mood, his or her expression is almost similar and universal to all round the world. Seeing the facial expression, we can easily conclude if one is angry, fearful, jealous, astonished or showing love, sympathy or hatred. In this way facial expression may be termed as one of the important modes of non-verbal communication.

Language of the Eye
Language of the eye may be considered as another important mode of non-verbal communication. Eyes, in fact, may convey all what is intended to be communicated by the communicator. Language of the eye may also be considered as common and universal to almost all cultures and societies of the world. The various idioms
and phrases showing movements and actions of the eyes like ‘Aankh Bichhana’ and ‘Ankhe Dikhana’ easily provide valid testimonial of its role in communication.

The language of the eye movements is somewhat so universal and familiar that it is very easy and simple to decode the feelings, thoughts and intentions conveyed by the communicator. When one turns his eyes, we can conclude that he is not interested in our friendship or conversation or wants to avoid us. Similarly, one can communicate well his emotion of fear, jealousy, anger, enjoy, hatred, greediness, temptation, lust, love, affection, apathy or sympathy etc. through the eye language.

Actually eye-to-eye contact forms the very basic of effective communication. When one focuses his eyes for having eye-to-eye contact with you in conversation, it means that he thinks you quite important for conversation. However, the way he gazes may convey his liking or disliking for you.

In the classroom communication, the necessary interaction links between the teacher and pupils are mostly maintained through the related eye language. The eye movements of the teacher may encourage a student in giving response or participating actively in any teaching-learning activity. Similarly, by reading through eye movements, the teacher can know whether the student is showing interest or disinterest in any classroom activity.

**Body Language**

Our body has an impressive and effective language for communicating our feelings, thoughts and actions. A classical dancer while performing on the stage may provide a substantial proof of the effectiveness of such communication through various gestures, postures and movements of her body parts. By seeing the body language, you may well conclude that now she is offering prayers, getting annoyed, nervous, tensed or feeling shyness, fearful, angry, jealous, envious, anxious, in love, or affection.

The body language, although seems to be somewhat universal and common, yet has a perfect cultural and social base. As a result every culture or society has its own body language which can be learnt the same way as the spoken language. Hence, one should be quite cautious while making use or interpreting of body language in communication. Let us cite a few instances for this purpose:

- In Tibet, the tribal people exchange greetings by protruding their tongues. In India, it will be communicated as insulting and teasing to the receivers.
- In India, you may use your stretch open palm for conveying the stop signal. However, doing such in Greece will be an outright insult to the receivers.
- In the Western culture, the people may welcome or greet through kissing, whereas kissing in public is not liked in India. We usually welcome or greet through joining hands, touching feet or shaking hands, etc.
The body language in its broad form may include various types of gestures and physical movements of the body parts. In such a broad form, it is quite commonly used by all speakers, stage or media actors, political and religious leaders, lawyers and advertising models while giving their performances at their workplaces. In our day-to-day conversations, we all are quite habitual to make use of it for communication. We convey the feelings of respect to our elders by touching their feet, welcome through joining our hands or say goodbye by shaking or raising our right hand. Our body speaks about our feelings of anxiety, fear, anger, happiness, sadness, affection, hatred, empathy and sympathy through its various actions and movements. The body language can be very effectively used by the teachers and pupils in the classroom for the healthy classroom interaction in almost all types of teaching-learning situations. The teachers may add colours and effectiveness to their explanations, expositions and demonstration skills, with the use of appropriate body language.

**Sound Symbols**

Many sound symbols and vocal cues also prove an effective medium for the desired communication. For example, when we are saying, narrating or explaining something to somebody and he is responding simply by uttering the sound hunh-hunh-hunh, it may work well for maintaining the chain of communication. We may properly visualize that he is paying attention and agreeing to the message communicated to him. Contrarily, when the listener utters the negative sound ‘unu hunch’ it means his disinterest or disagreement to the conveyed message. It becomes more distinctive and prominent when he also nods his head and neck along with the utterance of the negative sounds. Similarly, the utterance of the sound ‘uahn’ accompanied with the turning of the neck and twisting of the may provide a signal of one’s complete disliking or even feeling of hatred.

In addition to playing the role of a mediator or reinforce in conversation, the sound symbols or vocal cues may effectively act as potent carrier and conveyer of one’s thoughts and actions. For example, when one is making a pleasant sound through whistling or humming we may know that he is in a pleasant and happy mood and when one utters ‘hunn’ with anger he is said to be in angry or fighting mood. However, the interpretation of the sound symbols can only be made in context to the tone, volume and the situation prevailing at the time of the utterances of these sounds, i.e. whistling may be made to tease, attract and making indecent remarks to somebody.

**Symbolic Code Language**

Many times some special code language can also be used as an effective mode for the desired communication. The special code language prepared through the help of various gestures, postures and body movements can be used for communicating with the deaf and the dumb. You may very well judge the effectiveness of such communication if you have ever seen the telecasting of the news bulletin specially meant for the deaf and dumb population. One can also mix vocal cues and sound
symbols with the body language for having a code language. Since it is to be commonly shared, it must be well understood, used and interpreted in any form by its users. The users (senders and receivers) thus are free to invent any set of code language using any type of verbal and non-verbal symbols commonly shared among them.

In our day-to-day life also, we must have heard some groups of children or youngsters often talking to each other in their own code language. During the games different team members use the code language to give instruction or message to other team members. You may feel helpless in making any sense of their communication but they have their language for proper communication. Similarly, various types of well-thought and organized code languages are very effectively used in exchanging quite meaningful and secret information by the detective and security agencies operating all over the world. In this way, any commonly shared code language may prove an effective mode for the desired communication between the shared group members.

Print and Non-Print Media in Communication

Both print and non-print media are used in the communication process. Both these media can be classified as per the following diagram:

Check Your Progress

4. How does effective classroom communication depend upon the sender of the message/information?
5. Define proxemics.
3.6 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

NOTES

1. The precautions to be taken while using the heuristic oral communication strategy are the following:
   - Several outcomes: There may be several expected outcomes.
   - Several interactions: There may be several expected interactions.
   - No definite structure: The structure of content is not definite.

2. Decision tables are also called logic tables. This strategy was developed by Grad in 1961 and now it is used in computer-associated instruction. Decision tables are used in problem solving, question-answer and in providing information. When the students compare their answers with the correct answers and they find them correct, they feel pleasure. It provides them reinforcement. The wrong responses are used to diagnose the weaknesses of the students.

3. Mass media is any medium used to transmit mass communication. Radio, television, video, cinema, printed media like books, newspaper and magazines, the Internet, teleconferencing, satellite communication and transmission all come in the category of mass communication.

4. Effectiveness in the classroom communication to a great extent depends upon the strength and qualities of the sender or source. Therefore, all teachers should try to imbibe the virtues and qualities of an effective sender or sender of the message.

5. Proxemics is the study of perceptions of people on physical space and its use by them.

3.7 SUMMARY

- Two modes of communication are used in teaching process: (i) Oral communication, and (ii) Written communication. The modes of communication are selected on the basis of learning objectives.
- Decision tables are also called as logic tables. This strategy was developed by Grad in 1961 and now it is used in computer-associated instruction.
- The effectiveness of the communication is dependent on the type and nature of the media. Therefore, the selection of media becomes very important as far as efficiency and effectiveness are concerned.
Many open universities use multimedia strategy in delivery of their courses and provide access to learning resources through print, audio, video and the web.

Effectiveness in the classroom communication depends upon (1) the strength and qualities of source of communication, (2) the quality and nature of communication material (content), (3) the channel or communication media (verbal and non-verbal), (4) the strength and qualities of the (students) and (5) environmental conditions and situations.

Language is the key and the base of any verbal communication. Each society develops one or more forms of languages with spoken or written words for communicating with each other. Accordingly, we have local, regional, national and international language for the required communication.

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Chronemics studies the use of time in non-verbal communication. Time is an important determinant of a person’s image.

Also referred as vocalics, paralanguage is the study of non-verbal cues of the voice. These cues include the acoustic properties of speech, namely tone, pitch and accent, together called prosody. Paralanguage can emphasize or change the meaning of words.

The study of body movements, facial expressions and gestures is called kinesics. It is the non-verbal behaviour of the whole or part of the body. It examines and interprets behaviour, such as mutual gaze, smile, facial warmth or pleasantness, etc.

Facial expression may very well communicate the feelings, thoughts and intentions of the communicator. In general, face and facial expressions may be said to be a true index of one’s emotional and thinking behaviour.

Our body has an impressive and effective language for communicating our feelings, thoughts and actions. A classical dancer while performing on the stage may provide a substantial proof of the effectiveness of such communication through various gestures, postures and movements of her body parts.

Many sound symbols and vocal cues also prove an effective medium for the desired communication.

Many times some special code language can also be used as an effective mode for the desired communication. The special code language prepared through the help of various gestures, postures and body movements can be used for communicating with the deaf and the dumb.
3.8 KEY WORDS

- **Kinesics**: It is the study of body movements, facial expressions and gestures.
- **Oculesics**: It refers to the role of eyes in non-verbal communication. Eye contact shows attention, interest, and involvement.
- **Haptics**: It is the study of touching behaviour as non-verbal communication for example, kissing, slapping, patting and so forth.
- **Multimedia**: It is the use of a computer to present and combine text, graphics, audio, and video with links and tools that let the user navigate, interact, create and communicate.
- **Vocalization**: It refers to the expression of feelings or ideas in words.

3.9 SELF ASSESSMENT QUESTIONS AND EXERCISES

**Short Answer Questions**

1. Who developed the Algorithms written communication strategy?
2. State the differences between verbal and non-verbal communication.
3. Briefly mention the important modes of non-verbal communication.

**Long Answer Questions**

1. Explain the oral communication strategy with the help of a diagram.
2. ‘The effectiveness of the communication is dependent on the type and nature of the media.’ Justify the statement.
3. Discuss the principles of effective classroom communication.

3.10 FURTHER READINGS

UNIT 4  COMMUNICATION PROCESS AND INSTRUCTIONAL SYSTEM

4.0 INTRODUCTION

Barriers to communication have made the process of communication complex, difficult and frustrating. Communication is effective if it flows freely through an appropriate medium between the sender and the receiver. Free flow means uninterrupted transmission of information or message, correct comprehension of the message by the receiver, and relevant and appropriate feedback from him. Problems with any one of the components of communication can become a barrier to communication. Barriers to communications range from simple distracting noises to complex psychological factors.

4.1 OBJECTIVES

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

- Discuss the components of the communication process
- Explain verbal and non-verbal communication in the context of classroom communication
- Identify the factors affecting classroom communication

4.2 CONCEPT OF COMMUNICATION PROCESS

Communication is a process that involves a series of actions and a number of factors to transmit a message from one end to another. It would be good for you
if you look for the examples of communication around and then work out various steps of this process. Let us think of normal conversations we do every now and then. Think and analyse what happens when one is thirsty and wants a glass of water to quench the thirst. The person in question in this case is the sender of a message which is formulated in a language which the receiver of that message understands. If the language is English the message prepared could be a sentence like ‘give me a glass of water please!’ This is sent through a medium and the communication is considered as complete if the receiver of the message gives a glass of water to the originator of the message. In this case the action of giving the water would be the feedback. Sometimes the act of communication becomes difficult as there are many people talking to each other and in spite of talking loud to the extent of shouting the message may not reach the ears of the selected respondent. It is said that the noise in the channel has not allowed the communication to take place and as a result the receiver of the message has not reacted in the manner desired by the speaker.

Now let us understand various factors of communication without which the process of communication cannot be complete.

- **Sender (communicator):** The first factor essential for any communication to take place is the sender who wants to send a message to the person with whom he/she is communicating.

- **Message:** It is the end result of ideas, emotions and thoughts that the sender feels necessary to communicate.

- **Channel:** The message cannot be transmitted without a channel. The communication channels work in the same way as the English Channel would do for facilitating the movement of ships from one end to another.

- **Receiver (Audience):** All messages have a destination commonly known as the audience. In fact without them the existence of messages cannot be imagined.

- **Feedback:** The reaction or processes initiated by the receivers of messages is called the feedback. For example if somebody asks for a glass of water by saying, ‘Please give me a glass of water’, then the recipient of the message should respond to it by offering him/her a glass of water. This act of offering the glass of water would in this case be the feedback of the message.

- **Noise:** The messages always travel in the channels that are having many disturbances. Sometime the disturbances are the necessary part of the channels themselves. Telephonic lines work because they have current flowing in them which becomes the carrier of electro-magnetic waves. The noise is the cause of communication failure in many situations.

- **Encoding:** Encoding is the formulation of messages in the communicator’s mind. It means the communicator translates his purpose
Communication Process and Instructional System

(ideas, thought and information) into a message and also decides on the medium to communicate his planned message.

- **Decoding**: Decoding is the interpretation of the message by the receiver. The receiver looks for the meaning in the message which is common to both receiver and the communicator.

Encoding and decoding are two very significant elements in the process of communication. These elements have been frequently used by many scholars but have not been described adequately enough. The sender of the message needs to encode the message in signals that could be transmitted along a channel. Similarly, the receiver of the message has to decode the messages from the signals that have been transmitted. This appears to be very simple if we think in terms of voice to be converted into electromagnetic frequencies, but when we look deeper into communicative situations where the human psyche is involved then the complexities of encoding the messages is revealed.

The human emotions, ideas and thoughts are in the form of psychic image (de Saussure, 1913) and they have to be first converted into signs capable of being articulated in the form of speech which is later encoded into different kinds of signals like radio waves or script depending upon the medium one wants to use. This can be done only if the receiver of the message has the capability of decoding the speech from the signals so received and later decode the speech into psychic images that were intended by the sender. The communication cannot take place without these elements even if the other factors of communication are in place.

The encoding and decoding on further analysis become even more complex when the factors like individual’s personal experience (explained by Bertrand Russell as bundle of sensory experiences) and the social hierarchy and sub-cultures are included in the process. These factors start affecting the encoding and decoding of the messages and the notions of selectivity and availability (George Gerbner, 1956) are introduced.

**Roman Jacobson’s Model of Communication**

The process of communication has been best described by Roman Jacobson (1958). He has described the process with the help of two-layered model of communication in which the first layer describes the factors of communication and the second layer on the reverse describes the function of communication. Similarly, the factors described by Roman Jacobson are also a bit different than those described just above.

<table>
<thead>
<tr>
<th>Addresser</th>
<th>Context</th>
<th>Message</th>
<th>Addressee</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Code</td>
</tr>
</tbody>
</table>
4.3 CLASSROOM COMMUNICATION: VERBAL AND NON-VERBAL COMMUNICATION

Classroom communication is very important in teaching-learning, being the chief means by which the teacher and the students work together. In the words of R E de Kieffer and Lee W Cochran, “Effective teaching and communications are synonymous, for good teachers are clear communicators and good communicators are effective teachers .... Our society today has a vast array of modern media of communication .... These media are among the tools 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.

**Verbal and Non-verbal Communication**

Classroom communication between the teacher and the students can be categorized broadly into two types: (i) verbal communication, and (ii) non-verbal communication. The influence of verbal behaviours is mostly audible, while non-verbal behaviours have a vision-based impact on the listener.

**Barriers to Verbal Classroom Communication.** These are as follows:

1. Inaudibility of speech
2. Abnormal speed of speech
3. Unfamiliar pronunciation of the teacher
4. Use of unfamiliar words and technical terms without explanation
5. Lack of understanding of the basic knowledge of the students (referent confusion)
6. Daydreams on the part of the students on account of their inattentiveness
7. Unsystematic presentation of the subject matter
8. Lack of scope of immediate feedback
9. Lack of physical facilities in the classroom
10. Socio-economic and cultural differences among the students

**Non-verbal Communication:** Though verbal and non-verbal communication should go together, non-verbal has a separate impact of its own. It
also provides support to the verbal component. These include physical manifestations of inner feelings, facial expressions, bodily stance, voice variations, hand gestures, etc.

**Effective Classroom Communication**

The following factors may be considered in effective classroom communication.

i. **Two-way Communication:** Two-way communication instead of one way communication is needed if we are to communicate effectively. One-way communication, i.e., monologues, lecturing or telling or demonstrating by the teacher denies the students the facility to seek clarification. The learners remain passive listeners. Two-way communication has a built-in-system of feedback which ensures that further information, clarifications, etc., are provided whenever possible. The receivers or the learners get opportunities to understand the message or the content, and respond.

ii. **Effective Feedback for Efficient Teaching:** Feedback ensures that the message has reached the receiver. This can take the form of a nod, an acknowledgment or an execution of the behaviour suggested in the communication. Thus, the feedback provides a learning opportunity to the sender and the receiver because it mirrors the consequences of behaviour. In addition, if the behaviour is also incongruous with the message, it opens avenues to make corrections wherever necessary. Without feedback it would be difficult to ascertain whether communication has been received as intended or not. Positive and negative feedbacks may be used. When a learner does something commendable, a useful acknowledgement is made.

iii. **Communication and Principle of Clarity:** A communication possesses clarity when it is expressed in language – and transmitted in a way– that can be comprehended by the receiver. Clarity requires literary approach to language and familiarity with language patterns of the learners.

iv. **Development of Motivation:** Learners cannot listen or read with understanding unless they concentrate. Listening in fits and starts, listening inattentively or ignoring or skimming over written words ensures lack of understanding. Adherence to the need for attention will gradually overcome certain barriers to communication such as inattention, losses in transmission and poor attention. Motivation on the part of the learners will increase the quality of learning and they will certainly feel encouraged for making more efforts.

v. **Use of Technology/Instructional:** Teaching technology should be made use of in providing effective communication in classroom teaching.

vi. **Teaching Strategies and Skills:** They should be fully exploited to make communication inspirational and pragmatic.
4.4 FACTORS AFFECTING CLASSROOM COMMUNICATION

Sometimes obstructions are confronted in communication, as a result of which the transmitted message either goes wrong or received incompletely. Sometimes, communication relations are broken down. Among other types of barriers are included: a message being misread, a message having more than one meaning, deformities in a message, limitations of the message-receiver, shortcoming in the communication channel, sound pollution etc.

Dr Kumar (1996) has tabulated the chief barriers in communication as follows:

<table>
<thead>
<tr>
<th>Barriers in Communication</th>
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<tbody>
<tr>
<td><strong>Types of Barriers</strong></td>
</tr>
<tr>
<td>Physical barriers</td>
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<tr>
<td>Linguistic barriers</td>
</tr>
<tr>
<td>Psychological barriers</td>
</tr>
<tr>
<td>Background barriers</td>
</tr>
</tbody>
</table>

According to another scholar, barriers of communication can be classified into three types:

1. Barriers related to message-sender
2. Barriers related to message transmission
3. Barriers related to message-receiver

These barriers and difficulties can be classified in another way into the following types:

1. Linguistic barriers
2. Technical problems related to transmission
3. Problems related to the process of mutual influence
4. General problems related to transmission

Some Barriers

(i) **Noise**: Noise is a great barrier. Many times a message is lost in the noise, and it may be received incorrectly. Here, noise becomes a barrier.
(ii) **Language**: A word may have several meanings. Therefore, the use of word should be clear as to its context and place, else there may be misunderstanding.

(iii) **Previous Experience**: Sometimes we try to understand a stimulus on the basis of our past experiences. These past experiences are related to our background. Background experiences, needs, values and stimuli play an important role in encoding and decoding of a message. Sometimes the background experiences, needs, stimuli and values are very helpful in understanding a message correctly, and sometimes they become a barrier in understanding a message correctly.

(iv) **Emotions and Sentiments**: Different types of reactions occur in the mind on listening different types of words. These reactions depend on our emotions and sentiments. Favourable words give us good reactions and unfavourable words give incorrect reactions. Incorrect reactions result in misreading of the message. Thus, emotions and sentiments function like a barrier in the communication process.

(v) **Situational Context**: When a word, sentence or phrase is seen out of its context, then its sense undergoes a change, and the right meaning is lost. In such a situation, a message gives a wrong meaning. Therefore, it is necessary to look at a message in the right context; else it will work as a barrier in the communication process.

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**Check Your Progress**

1. What does ‘decoding’ imply in the communication process?
2. List any two barriers to verbal classroom communication.
3. What are linguistic barriers in communication?

### 4.5 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. Decoding is the interpretation of the message by the receiver. The receiver looks for the meaning in the message which is common to both receiver and the communicator.

2. Two barriers to verbal classroom communication are the following:
   i. Unfamiliar pronunciation of the teacher
   ii. Use of unfamiliar words and technical terms without explanation

3. There are several kinds of barriers in communication. Linguistic barrier refers to the use of unclear words, grinding words, unclear pronunciation, unclear graphics and symbols.
4.6 SUMMARY

- Communication is a process that involves a series of actions and a number of factors to transmit a message from one end to another. It would be good for you if you look for the examples of communication around and then work out various steps of this process.

- Encoding and decoding are two very significant elements in the process of communication. These elements have been frequently used by many scholars but have not been described adequately enough.

- Classroom communication is very important in teaching-learning, being the chief means by which the teacher and the students work together.

- 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.

- Classroom communication between the teacher and the students can be categorized broadly into two types: (i) verbal communication, and (ii) non-verbal communication. The influence of verbal behaviours is mostly audible, while non-verbal behaviours have a vision-based impact on the listener.

- Though verbal and non-verbal communication should go together, non-verbal has a separate impact of its own. It also provides support to the verbal component. These include physical manifestations of inner feelings, facial expressions, bodily stance, voice variations, hand gestures, etc.

- Sometimes obstructions are confronted in communication, as a result of which the transmitted message either goes wrong or received incompletely.

- Sometimes the background experiences, needs, stimuli and values are very helpful in understanding a message correctly, and sometimes they become a barrier in understanding a message correctly.

4.7 KEY WORDS

- **Message**: It is the end result of ideas, emotions and thoughts that the sender feels necessary to communicate.

- **Encoding**: It is the formulation of messages in the communicator’s mind.

- **Motivation**: It is the process of stimulating people to actions to accomplish the goals.
4.8 SELF ASSESSMENT QUESTIONS AND EXERCISES

Short Answer Questions
1. Write a short note on Roman Jacobson’s Model of Communication.
2. What are the ways to ensure effective classroom communication?

Long Answer Questions
1. Explain the various components of the communication process.
2. ‘Classroom communication is very important in teaching–learning, being the chief means by which the teacher and the students work together.’ Discuss.
3. Discuss the categorization of barriers in communication as recognized by the research scholars.

4.9 FURTHER READINGS
Classroom interaction is aimed at conveying information to students in a meaningful manner. The traditional methods of teaching included lecture method, seminar method, symposium and so forth. However, now with the advancement of technology numerous new methods have evolved which have enhanced both the teaching method and the learning of students. This unit will brief you about the observation schedules of classroom interaction, Flanders Interaction Analysis Category System (FIACS), Reciprocal Category System (RCS), Equivalent Talk Categories (ETC) and the various instructional strategies used in the teaching-learning process.
5.1 OBJECTIVES

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

- Discuss the observation schedules of classroom interaction
- Explain Flanders Interaction Analysis Category System (FIACS)
- Discuss the Reciprocal Category System (RCS)
- Explain the Equivalent Talk Category System (ETC)
- Describe the various instructional strategies using in the teaching-learning process

5.2 OBSERVATION SCHEDULES OF CLASSROOM INTERACTION

Classroom observation is a quantitative technique of measuring classroom behaviour. The behaviour is calculated from direct observations that recognize both the behaviour and events that are to be observed and how they are to be recorded.

To effectively examine teaching quality there are several types of observational techniques or procedures that have been used (e.g., rating scales, charts, checklists, and narrative descriptions). The systematic classroom examination based on interactive coding structures is the most widely used research method. Everything that teachers and students do during a specified time interval is documented by these interactive coding systems. There are several commonly used observation gadgets as the Classroom Observation Schedule, Stallings Observation System, Flanders Interaction and Brophy-Good Dyadic Interaction System. They all have been widely used to advance classroom instruction.

Some of the major strengths of using Classroom observation are of massively efficient use to the educators for teaching effectively. It also helps them do the following:

i. Encourage change and substantiate that the change has taken place.
   The reports of instructional events that are provided by this method have also been established to lead to better understanding and better models for successful teaching.

ii. To study the processes of education in naturalistic settings;

iii. Offers more comprehensive and exact evidence than other data sources.
Purposes of Classroom Observation

There are many valid and important educational purposes of classroom observation. The classroom observation has been widely used for the following purposes:

i. Examination of instructional imbalances for different groups of students;

ii. Enhancement of teacher’s classroom instruction based on feedback from individual classroom or school profiles; and

iii. Explanation of instructional practices

One of the most significant functions of systematic classroom observation is to get better teacher’s classroom instruction by improving the lessons. Observational methods have shaped important information that has everyday inference for the enhancement of teaching practices. Lack of accurate and valid information that teachers might use in order to facilitate their professional development is a traditional problem holding back teacher’s classroom instruction. Feedback from individuals helps teachers recognize their own weaknesses and strengths, and accordingly enable them to considerably develop their instruction.

New Directions

The new directions for classroom observation include the following:

i. Linking both qualitative and quantitative methods in observation systems;

ii. Developing observation instruments that are based on ‘standards’ of pedagogy;

iii. Using student-centered observation instruments that allow for comparisons between groups of students within the class; and

iv. Using instruments that assess authentic, interactive instructional practices that have been found to relate to student gains on higher-level cognitive outcomes.

The Flanders system is an observational tool used to classify the verbal behaviour of teachers and pupils as they interact in the classroom. Flanders instrument was designed for observing only the verbal communication in the classroom and non–verbal gestures are not taken into account. The basic assumption of the system is that in the classroom the verbal statement of a teacher is consistent with his non-verbal gestures or with his total behaviour. Flanders has categorized the instruction of teachers and pupils in classroom. There are 10 categories in this system.
Table 5.1 Flanders Interaction Analysis Categories

<table>
<thead>
<tr>
<th>Category number</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Teacher talk response</strong></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Accept feeling: Accepts and clarifies an attitude or the feeling tone of a pupil in a non-threatening manner; feeling may be positive or negative.</td>
</tr>
<tr>
<td>2</td>
<td>Praises or encourages: Praises or encourages pupil action or behaviour; Jokes that release tension, but not at the expense of another individual. Nodding head, or saying 'UMHM'</td>
</tr>
<tr>
<td>3</td>
<td>Accepts or uses ideas of pupils: Clarifying or building or developing ideas suggested by a pupil. Teacher extensions of pupil ideas are included but as the teacher brings more of his own ideas into play, shift to category five.</td>
</tr>
<tr>
<td>4</td>
<td>Ask questions: Asking a question about content or procedure with the intent that a student may answer.</td>
</tr>
<tr>
<td><strong>Initiation</strong></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Lecturing: Giving facts or opinions about content or procedures; expressing his own ideas; asking rhetorical questions.</td>
</tr>
<tr>
<td>6</td>
<td>Giving direction: Directions, commands or orders to which a pupil is expected to comply.</td>
</tr>
<tr>
<td>7</td>
<td>Criticizing or justifying authority: Statements intended to change pupil behaviour from unacceptable to acceptable pattern; stating why the teacher is doing what he is doing.</td>
</tr>
<tr>
<td><strong>Pupil talk Response</strong></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Pupil talk in response to teacher: Talk by students in response to teacher. Teacher initiates the contact or solicits students statements.</td>
</tr>
<tr>
<td><strong>Initiation</strong></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Pupil talk initiated by the pupil: Talk by students which they initiate. It is 'calling on student' – only to indicate who may talk next, observer must decide whether the student wanted to talk.</td>
</tr>
<tr>
<td><strong>Silence</strong></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Silence or confusion: Pauses, short periods of confusion at which communication cannot be understood by the observer.</td>
</tr>
</tbody>
</table>

Advantages of FIACS

i. It is a reliable technique of observing and analysing the verbal behaviour of a teacher and classroom interaction.

ii. It helps in understanding what goes on in the classroom.

iii. It helps in determining the flow and pattern of teaching behaviour.

iv. By providing feedback, it helps in acquiring the desirable patterns of teaching and modifying one’s teaching behaviour.

v. It helps to practice and learn new desirable teaching behaviour.

vi. It supplements micro teaching and team teaching.

vii. It can be used for undertaking research.

viii. It helps to determine the classroom environment.

ix. It helps in modification of teacher behaviour.

5.2.1 Flanders's Interaction Analysis Category System (FIACS)

Several techniques have been devised to observe and analyse teacher behaviour and interaction analysis in the classroom. One of the most important techniques is the one developed by Ned A. Flanders, and was used by him in the year 1959 at the University of Minnesota as a teacher training technique.
In Flanders’s interaction analysis system, the entire classroom interaction is split into three main sections: (a) Teacher talk, (b) Student talk, and (c) Silence or confusion. In this method, an observer observes a teacher’s verbal behaviour and puts a tally every three seconds against one of the ten categories of teacher behaviour as may occur after observation, the total number of tallies in each category are counted and the ratio between teacher talk and student talk determined. We have better student–teacher interaction if phases of teacher talk are frequently followed by student talk, and student talk by teacher talk.

Teaching is an interactive process which is mainly influence-directed. A teacher tries to influence the students. However, this influence is not only one way. Both the teachers and students influence each other, but the influence exerted by the teacher on the students is of greater and far reaching significance. The question arises as to how to describe a teacher’s behaviour which is not only complex but variable as well. Flanders’s “Interaction analysis is an observational procedure designed to minimize these difficulties, permit a systematic record of spontaneous acts, and scrutinize the process of instruction by taking into account each small bit of interaction.”

Indirect Influence of Teacher Behaviour Concepts: This is defined as actions taken by the teacher which encourage and support student participation. We can define indirect behaviour operationally by noting the percentage of teacher statements falling into categories 1, 2, 3, and 4.

Direct Influence: This refers to actions taken by the teacher which restrict student participation. This increases the control of the teacher and stimulates conformity and compliance. In direct influence, the net result is the decreased extent of freedom of action for the students.

We can define direct behaviour operationally by noting the percentage of teacher statements falling into categories 5, 6, and 7.

Concepts that Refer to Student Behaviour: Categories 8 and 9 represent student talk. As a matter of fact, these two categories are directly related to teacher talk. If the teacher does not impose restrictions, there is a greater amount of student talk.

Construction of Interaction Matrix: Encoding

For every three-second period, one of the ten categories is recorded by a trained observer. The sequence of observation that results is shown on a 10 × 10 matrix whose rows and columns correspond to the categories. Observations are tabulated on this matrix by pairs.
### Table 5.2 Categories of Interaction Analysis

| Teacher Talk |  |
|--------------|--
| **Indirect Influence** |  |
| 1. Accepts Feelings: Accepts and clarifies the feeling tone of the students in a non-threatening manner. Feelings may be positive or negative. Predicting or recalling feelings are included. |
| 2. Praises or Encourages: Praises or encourages students’ action or behaviour. Joke that release tension, not at the expense of another; individual nodding head or saying “Um hmn” or “go on” are included. |
| 3. Accepts or Uses Idea of Student: Clarifying, building or developing ideas suggested by a student. As a teacher brings more of his own ideas into play, it shifts to category five. |
| 4. Asks Questions: Asking a question about content or procedure with the intent that a student answers. |
| **Direct Influence** |  |
| 5. Lecturing: Giving facts or opinions about content or procedure: expressing his own ideas, asking rhetorical questions. |
| 6. Giving Directions: Directions, commands or orders to which a student is expected to comply. |
| 7. Criticizing or Justifying Authority: Statement intended to change student behaviour from non-acceptable to acceptable pattern: chiding someone, stating why the teacher is doing what he is doing: extreme self-reference. |
| **Student Talk** |  |
| 8. Student Talk–response: Talk by student in response to teacher. Teacher initiates the contact or solicits student statement. |
| 9. Student Talk–Initiations: Talk by students, which they initiate. Students start putting questions to teachers in order to seek more clarification on a point or topic. |
| **Silence or Confusion** |  |
| 10. During teaching, the teacher sometimes observes silence for a few seconds: a teacher may also pause sometimes. For instance, a teacher may put a question to the entire class, followed by a pause for a few seconds. Both the teacher and the students are silent. During this period of silence, the students get time to think, gain confidence and stand up to give the answer. |
Classroom Interaction

Sample Matrix (Reproduced from Flanders)

<table>
<thead>
<tr>
<th>Category</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>Total</th>
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</thead>
<tbody>
<tr>
<td>1</td>
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<td></td>
<td></td>
<td>12</td>
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<td>3</td>
<td></td>
<td>8</td>
<td>17</td>
<td>4</td>
<td>1</td>
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<td>1</td>
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<td></td>
<td>32</td>
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<td>4</td>
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<td>14</td>
<td>3</td>
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<td>1</td>
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<td>104</td>
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<tr>
<td>5</td>
<td>1</td>
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<td></td>
<td>1</td>
<td>2</td>
<td>105</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td>5</td>
<td>5</td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td>27</td>
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<tr>
<td>7</td>
<td>1</td>
<td></td>
<td>2</td>
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<td>3</td>
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<td>13</td>
<td>27</td>
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<td>8</td>
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<td>9</td>
<td>15</td>
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<td>6</td>
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<td>3</td>
<td>2</td>
<td></td>
<td>44</td>
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<tr>
<td>9</td>
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<td></td>
<td>4</td>
<td>17</td>
<td>13</td>
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<td>2</td>
<td>1</td>
<td></td>
<td>66</td>
</tr>
<tr>
<td>10</td>
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<td>1</td>
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<td>8</td>
<td>17</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1</td>
<td>12</td>
<td>32</td>
<td>104</td>
<td>105</td>
<td>27</td>
<td>13</td>
<td>44</td>
<td>66</td>
<td>17</td>
<td>421</td>
</tr>
</tbody>
</table>

Interpreting a Matrix: Thus, teacher talk is the sum of first 7 categories 1 to 7, i.e., \(1 + 12 + 32 + 104 + 105 + 27 + 13 = 294\).

Student talk is the sum of categories 8 and 9 i.e. \(44 + 66 = 110\).

This means that out of 421 talks, teacher talks are 294 and students talk 110 which comes to 69.8 per cent and 26.2 per cent respectively.

Following conclusions may be drawn from the above:
1. The teacher is active.
2. The control of interaction rests with the teacher.
3. 50.7 per cent of teacher’s statements are indirect, i.e., sum of first four categories \(1 + 12 + 32 + 104 = 149\) out of 294.
4. The flow of communication between the teacher and the student is flexible and shifts from one category to another.
5. The class is business like and works rapidly.

Flanders observed, “It will be the responsibility of the education instructor to help prospective teachers discover what their teaching intention should be and then create training situations in which behaviour gradually matches intention with practice. Teaching will remain an art but it will be studied scientifically.”

Use of the Model

i. The category system can be used for research in verbal interaction for pre-service and in-service education of teachers.

ii. The concept of ‘flexibility of teacher influence’ can be investigated.

iii. The techniques may help in the grouping of students.
Procedure of Observation—The Encoding Process

i. The observer sits in a classroom in the best position to hear and see the participants.

ii. At the end of each three-second period, he decides which category best represents the communication events just completed.

iii. He writes down the category number while simultaneously assessing communication in the next period and continues at a rate of 20 to 25 observations per minute, keeping his tempo as steady as possible.

iv. His notes are merely a series of numbers written in a column, top to bottom so that the original sequence of events is preserved.

v. Occasionally, marginal notes are used to explain the class formation of any unusual circumstances.

vi. When there is a major change in the class formation, the communication pattern or the subject under discussion, a double line is drawn and the time indicated.

vii. As soon as the total observation is completed, the observer retires to a nearby room and completes a general description of each separate activity period separated by the double lines including the nature of activities, the class formation and the position of the teacher.

Principles of Observation: Flanders listed the following principles for classroom observations:

i. No interaction analysis data should be collected unless the person is familiar with the entire process and knows its limitations.

ii. Questions to be answered by inspecting the matrix should be developed before the observation takes place.

iii. Value judgements about good and bad teaching behaviour are to be avoided.

iv. Emphasis is to be given to the problem being investigated so that cause-and-effect relationship can be discovered.

v. A consultation based on two observations or at least two matrices helps to eliminate value judgement or at least control them. Comparisons between the matrices are more likely to lead to principles.

Decoding: Decoding of the interaction matrix is the interpretation stage. Decoding may be done at two levels: (i) Quantitative analysis of the teacher behaviour, and (ii) Qualitative analysis of the teacher behaviour.

Sample matrix (reproduced from Flanders) can be easily interpreted.

Classroom Use of the Flanders System: It helps the teacher in the grouping of students by analysing student talk. It provides feedback to the teacher and thus helps him in modifying his pattern of teaching and behaviour. It helps in
understanding analytically what goes on in the classroom and what should be done to improve teaching–learning environment.

The advantages/merits of Flanders’s Interaction Analysis System have been discussed in the above section.

Limitations and Demerits of the Flanders System

i. The system concentrates on verbal behaviour and does not describe the classroom interaction or teacher behaviour in its totality.

ii. Out of ten categories, it devotes as many as seven categories to teacher talk and just three to student talk.

iii. The use of this system presupposes highly trained observers and interpreters.

iv. Equating silence with confusion is not appropriate.

v. There is much scope for subjectivity in the observation of the behaviour.

vi. The process of tallying, constructing matrix and interpreting of matrix consumes a good deal of labour, money and time.

vii. It hardly takes into consideration classroom interaction in the form of student–student interaction.

viii. The system does not incorporate various essential steps of teaching a particular subject.

ix. It does not provide value judgements about good and bad teaching behaviours.

x. Certain activities like chart and map reading in social studies, model reading in languages and demonstrations and experiments in science do not find appropriate classification in this system.

xi. The fourth category of asking questions in this system does not classify the type of questions asked.

Precautions on Using Interaction Analysis

i. Interaction analysis data should be collected only when the person is familiar with the entire process and knows its limitations.

ii. Questions to be answered by inspecting the matrix should be developed before the observation takes place.

iii. Value judgements about good and bad teaching behaviour should be investigated so that cause and effect relationships can be discovered.

iv. A consultation based on two observations or at least two matrices helps in eliminating value judgements or at least in controlling them.
5.2.2 Reciprocal Category System (RCS)

The RCS was developed by Richard Ober of the University of Florida in 1967. This system is an adaptation of the Flanders system. It contains ten categories. It is based on the principle of reciprocity which means that for every teacher behaviour that can be observed in the classroom, there exists a corresponding student behaviour. There are nine categories in this system which can be applied to teacher talk or student talk in a reciprocal manner.

Besides these, there is a general category which concerns itself with silence or confusion.

Principal Features of RCS

i. It devotes equal attention to teacher talk and student talk.
ii. Observation of classroom verbal interaction with particular emphasis on socio-emotional climate of the classroom is possible.
iii. It provides for noting the warming and cooling behaviour of teachers and students.
iv. There is also a provision for noting the positive and negative reinforcement factors.

Merits of RCS

i. It gives equal attention to teacher talk and student talk by providing reciprocal categories.
ii. It helps the teacher in planning strategies by providing a set of organized patterns of instruction.
iii. It makes it possible to observe classroom verbal interaction, with particular emphasis on the socio-emotional climate of the classroom.
iv. It may encourage the development of teacher-made observation systems.
v. It may help the teacher in maintaining secrecy with regard to his teaching performance. He may record the classroom events on a tape or video and evaluate his behaviour for bringing about necessary changes.

Limitations of RCS

i. It does not describe the classroom interaction in its totality. It overlooks some important behaviours like quality of verbal information and reacting behaviours.
ii. It concentrates heavily on the socio-economic and socio-emotional aspect of learning at the cost of the cognitive aspect and intellectual activities of the classroom.
iii. It makes no provision for managerial skills.
iv. It is not possible to make proper value judgements regarding good or bad teaching behaviour.
### Table 5.3 Reciprocal Category System (RCS)

<table>
<thead>
<tr>
<th>Category number assigned to teacher talk</th>
<th>Description of the verbal behaviour assigned to student talk</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td><strong>Warms</strong>: (i.e., informalizes) the climate</td>
</tr>
<tr>
<td></td>
<td>(i) Tends to open up and/or eliminate the tension of situation.</td>
</tr>
<tr>
<td></td>
<td>(ii) Praises or encourages the action behaviour components,</td>
</tr>
<tr>
<td></td>
<td>ideas and/or contributions of another.</td>
</tr>
<tr>
<td></td>
<td>(iii) Jokes that release tension not at the cost of others.</td>
</tr>
<tr>
<td></td>
<td>(iv) Accepts and clarifies the feeling tone of one another</td>
</tr>
<tr>
<td></td>
<td>in a friendly manner.</td>
</tr>
<tr>
<td>2.</td>
<td><strong>Accepts</strong>: accepts the action, behaviour, comments on ideas of others, positive reinforcement of these.</td>
</tr>
<tr>
<td>3.</td>
<td><strong>Amplifies</strong>: accepts the contribution of another: asks for clarification, builds on and develops the action, behaviour, comments, ideas and or contributions of another.</td>
</tr>
<tr>
<td>4.</td>
<td><strong>Elicits</strong>: asks a question or requests information about the content, subject or procedure with the intent that another should answer.</td>
</tr>
<tr>
<td>5.</td>
<td><strong>Responds</strong>: gives direct answer or response to questions or requests for information that are initiated by another; includes answers to one’s own questions.</td>
</tr>
<tr>
<td>6.</td>
<td><strong>Initiates</strong></td>
</tr>
<tr>
<td></td>
<td>(i) Presents facts, information, and/or opinions concerning the content, subject or procedures besides concerns that are self-initiated.</td>
</tr>
<tr>
<td></td>
<td>(ii) Expresses his own ideas.</td>
</tr>
<tr>
<td></td>
<td>(iii) Lectures include rhetorical questions not intended to be answered.</td>
</tr>
<tr>
<td>7.</td>
<td><strong>Directs</strong>: gives directions, instructions, orders and/or assignments to which another is expected to comply.</td>
</tr>
<tr>
<td>8.</td>
<td><strong>Corrects</strong>: tells another that his answer or behaviour is inappropriate or incorrect.</td>
</tr>
<tr>
<td>9.</td>
<td><strong>“Cools”</strong> (:formalizes) the climate:</td>
</tr>
<tr>
<td></td>
<td>(i) Makes statements intended to modify the behaviour of another from an inappropriate to appropriate pattern,</td>
</tr>
<tr>
<td></td>
<td>(ii) May tend to create a certain amount of tension.</td>
</tr>
<tr>
<td>10.</td>
<td><strong>Silence or Confusion</strong>: pauses, short period of silence and periods of confusion in which communication cannot be understood by the observer.</td>
</tr>
</tbody>
</table>

### Comparative Study of Flanders’s and the RCS System

i. The RCS is a modification of Flanders’s ten category system.

ii. Category No. 7 of the RCS system is the same as category No. 6 of the Flanders system.
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iii. Category No. 4 of the Flanders’s system is the same as category No. 4 of RCS system.
iv. Category No. 8 of RCS system is equivalent to category No. 7 of the Flanders system.
v. Category No. 10 in Flanders’s system is the same as compared to RCS system.

5.2.3 Equivalent Talk Category System (ETC)

This system was developed by Ernest L Bentley and Edith Miller at Atlanta in 1970. It is an outgrowth of their extensive work with the Reciprocal Category System (RCS). Its main features are:
i. It is designed to classify classroom verbal interaction, and places special stress on the quality of verbal actions and reacting behaviours.
ii. It makes possible the systematic observation of the functions, for instance, presenting, questioning, responding, structuring, etc., that directly affect the level of cognitive interaction in the classroom.
iii. It may be used in classifying either teacher or student talk.

Basic Beliefs/Merits of the Rationale for ETC

Ober and others (1971) pointed out the following basic beliefs for the rationale for ETC.
i. Teaching of thinking is an important educational activity.
ii. Teaching strategies play an important role in the development of thinking abilities.
iii. Objective feedback concerning strategies facilitates awareness control.
iv. Categories included in the ETC are behaviours important in the development of teaching skills.
v. Teachers can improve student level of thinking through the use of ETC.
vi. Self-analysis is the most appropriate evaluative approach. Teachers will change more readily through self-analysis than through outside supervision.
vii. Most of the classroom teachers can learn ETC in a relatively short training period.
viii. Its usefulness is enhanced because of ease in its use and general applicability across the range of school subjects.

Limitations of ETC

i. It does not provide for any standard judgement for teacher behaviour.
ii. It does not pass any final judgement on teacher behaviour.
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iii. It makes possible to analyse cognitive verbal behaviour only. It neglects the analysis of non-cognitive behaviours.

iv. It pays little consideration to the socio-emotional interactions of the classroom.

v. It does not provide for the improvement of managerial skills.

RCS System and ETC System

a. ETC has developed from the RCS system.

b. There are nine categories of teacher talk in both RCS and ETC systems.

c. Category No. 10 of ETC is the same as category No. 10 of the RCS.

d. ETC is considered important for developing thinking skills.

Check Your Progress

1. List the principles of observation as mentioned by Flanders.

2. Mention the precautions to be adhered while using the interaction analysis.

3. Who developed the Equivalent Talk Category System (ETC)?

5.3 DESIGNING INSTRUCTIONAL STRATEGIES

Instructional strategies are a way or techniques used by teachers in order to help students learn. Thus, it can be said that these strategies help students in becoming independent strategic learners. In the learning process which refers to relatively permanent change in behaviour, instructional strategies help in bringing about the desired changes.

Instructional strategies are used synonymously with learning strategies. However, there is basic difference between the two. Learning strategies are student dependent. When students independently select the appropriate strategies and use them effectively to accomplish tasks or meet goals then instructional strategies are referred to as learning strategies. Instructional strategies can help to do the following:

i. Motivate students in focusing attention to achieve the desired goal or learning the desired thing.

ii. Help students in organizing information for understanding and remembering the content.

iii. Students can themselves keep track of their own learning.

However, in order to become successful strategic learners students need the following:

i. Strategic instruction in a step by step manner

ii. Variety in terms of instructional approaches and learning materials used
iii. Should be provided appropriate support such as modelling, guided practice as well as making them practice independently

iv. Opportunities to transfer skills and ideas from one situation to another since transfer of learning is very important for comprehension

Education is a lifelong process which begins in the cradle and ends in the grave so instructional strategies used must make students understand the meaningful connections between ideas and real-life situations. Learning strategies give students the ability to think on their own and in their own preferred way. Instructional or we can say learning strategies provide students encouragement as well as opportunities to self-monitor and self-correct their own learning.

Some major types of instructional strategies have been discussed in this unit.

5.3.1 Lecture Strategy

The lecture method is one of the widely acknowledged and most frequently used instructional strategies in the classrooms. In fact, it is one of the oldest teaching strategy that is used by the teachers for presenting a segment or unit of a desired content material to a group of learners.

Although with the passage of time and development of several innovative strategies and methods, the usefulness of several other teaching strategies such as brainstorming and individualized instruction has been widely acknowledged by various studies and researches. The lecture method is still one of the highly used and important ways to communicate information. Although the traditional lecture method has been criticized on several grounds such as it develops monotony, and makes students passive learners, but still as a matter of fact the traditional lecture can be an effective way to achieve instructional goals when used along with other teaching strategies in which students are involved actively.

Cashin, 1990 made the following recommendations for increasing the effectiveness of the lecture method. According to him, a well form of lecture method should have the following aspects:

i. The lecture should be according to the type of the audience.

ii. The teacher giving lecture should not try to cover all the aspects in one lecture rather the focus should be to make things clear even if only one topic is being covered as this type of instruction enhances understanding.

iii. The teacher should also make prior preparations by preparing an outline of what has to be covered in one lecture. Sometimes the teachers deviate from the main content while giving the lecture so it is advised that they organize their points in a logical manner as per the class to be taken.

iv. While giving lectures teachers also need to present appropriate examples or illustrations for making students attentive and conscious.
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v. Teachers also need to deal with issues taking a holistic perspective because in lecture method there are chances that teachers’ own perspective dominates.

vi. Teachers should be ready to repeat the points where ever necessary.

vii. Audience should not be taken for granted rather their feedback must also be noticed.

viii. The teachers also need to be enthusiastic and must have the capacity of arousing interest of their students.

Advantages of the Lecture Approach

i. In lecture method there is opportunity to communicate a large amount of information to a large audience at a time.

ii. There is more of a teacher control in lecture method since students are mostly passive listeners.

iii. Unlike student-centred methods in the lecture method it depends on the instructor to decide the direction, aim and content of the class or lecture.

iv. Effective lecture method can be used to enhance and arouse the interest of students in a subject matter.

v. In lecture method, the content can be complemented and clarified by the student.

vi. It can be said that lecture method in-fact backs up some individual learning preferences used by students as many students depend upon the structure provided by highly teacher-centred methods.

vii. A large number of audience can be handled at a time.

Disadvantages of Lecture Method

i. Students are not active but are passive which may hinder learning. There is mostly one-way communication so students may also become hesitant and reluctant in presenting their views. Therefore, it is highly advised in the lecture method that the lecturer must make a conscious effort to become aware of the problems of the students and how much the students understand.

ii. The students also need to devote a considerable amount of time for being able to understand the concept on their own if they are unable to grasp it through lecture and are hesitant to speak in class.

iii. It is not mandatory neither a rule of the lecture method but the lecture depends to a great extent upon the speaking skills of the orator. Since to make the teaching-learning process interactive and engaging for students, lecture method puts a hidden demand on teachers to be good communicators.

iv. Further, one of the major disadvantages of lecture method is that the teachers do not know the levels and needs of students as a result it makes the students
detached from the teaching-learning process. This leads the students to forget the things easily and quickly.

v. Also in present times when there is wave of constructivism, lecture method must be made more engaging for students without which the desired outcome might not be achieved.

5.3.2 Workshop Method

Workshop method is a way of providing instruction in which student teachers are given opportunities to work on their own. The framework for a workshop model that can be used is as follows:

i. Warm up: At this stage the teacher may give a brief assignment to students that can be done independently for making them ready for learning.

ii. Mini lesson: Mini lessons orient the student teacher towards the aims and objectives of the workshop and also towards the basic contents of the workshop. It may include the following things:

   o Teaching of a key concept
   o Demonstrating the things if there is need
   o Expectation of the completed work

The mini lesson is followed by making students work independently in small groups or on their own. This is followed by share session with the main focus on recapitulating what is taught and learned during the day.

5.3.3 Seminar Method

Seminar method is an instructional technique. It can be termed as an instructional technique involving higher order thinking in which students involve in interaction among themselves on a theme. The teacher generates a situation for a group of individuals to have a guided discussion.

Seminar method can be termed as a structured group discussion method and has been practiced in Indian education system since gurukul days. In ancient Indian education system there is description of seminar method teaching learning process in which students got a chance to present their own ideas and also become aware of the others.

According to Francis Bacon, ‘Reading maketh a full man, writing an exact man and conference a ready man’. Thus, it can be said that seminar which is a form of conference makes human personality grow. The skills such as reading, writing and talking are essential for the development of personality. The seminar method integrates such skills of reading and writing with presentation skills aiding in overall development. Seminar method can be used to accomplish higher objectives of cognitive and affective domain since it provides the opportunity to integrate the various dimensions and aspects and provides a platform to student teachers to discuss and comprehend things.
Higher order thinking skills require logical thinking, conscious thinking, ability to reflect upon and being creative. Seminar method makes student teachers to be able to achieve these higher order thinking skills and helps in learning by integrating all these processes together. It provides a platform to be able to learn these highly complex processes in a simple and easy manner without being consciously aware that one is acquiring complex cognitive things in a simple manner.

**Aims and Objectives of Seminar Method**

The aims and objectives of seminar method can be explained under two broad categories—cognitive and affective.

1. **Cognitive objectives**
   
   i. To help student teachers in developing higher cognitive abilities.
   
   ii. To make student teachers able to respond on the spot, making sound and logical discussions.
   
   iii. To make student teachers able to express their ideas and thoughts in a logical and coherent manner.
   
   iv. It makes student teachers able to be clear and unambiguous about one’s own thought processes.
   
   v. Seminar method also makes the individuals aware of the thought processes of others and their ideas and what approaches they are using. This may help in adopting fruitful thinking strategies for one self.

2. **Affective objectives**
   
   i. Student teachers learn to appreciate, tolerate and give cognizance to the views and ideas of others.
   
   ii. Seminar method also helps in developing the emotional ability among the participants of the seminar.
   
   iii. It helps in acquiring the right ways of putting questions as well as of answering questions put up by others effectively. Seminar method along with providing scholastic, academic and intellectual way of discussing things with the ability to learn smart cognitive and affective ways, also help in acquiring the hidden decorum and conducts a discussion or talk on any academic forum in a proper manner.

**Types of Seminars**

Seminars are mainly conducted at higher levels since they require a certain level of understanding and ability of reflection and comprehension on the part of students. However, on the basis of size of the group and organizational features, seminars can be of the following types:

- Mini seminar
• Major seminar
• National seminar
• International seminar

i. Mini seminar: Mini seminars are generally small and simple. These types of seminars do not require a large audience. Rather they can be conducted in small groups. Teachers have to discuss various things in day-to-day classroom activities. These discussions can be given the shape of a seminar by making the discussion conducted in a more formal way. That is to say mini seminars can be conducted at the classroom level also where the teacher simply needs to give students the opportunity to present their ideas in a more formal way unlike group discussion.

ii. Major seminar: When the number of participants in a seminar is more the type of seminar can be referred to as major seminar. With the increase in number of participants, the organization required also increases and consequently the term major is used. An example of this type of seminar can be college or school level seminars conducted in which students and teachers participate.

iii. National seminar: National seminar as the name suggests are conducted at the national level. These types of seminars are more formal and demands a more advanced level of organization and prior preparation.

iv. International seminar: International seminars are the one in which there can be participants from around the world. These types of seminars can be conducted by a national or international agency. Theme of these types of seminars have much wider aspects that covers broader areas such as globalization, renovation, atomic energy agreements, policies implementation and modification which can be of interest at the international level. An international seminar can be conducted in central or state institutes and organizations.

From the above discussion it becomes clear that seminar involves higher order thinking skills and provides student teachers an opportunity to monitor and reflect on their own knowledge as well as the chance to become aware of ideas of others. Along with this, it also provides the student teacher a way to make teaching learning process all the more engaging by making students take part in the seminar method teaching strategies. For the matter of understanding and convenience, seminar method can be divided into three phases:

• Pre seminar phase
• Seminar phase
• Post seminar phase
Activities Involved in the Pre Seminar Phase

Pre seminar phase is the period in which preparation regarding the seminar to be conducted is done. The following activities are usually done in preliminary stage of seminar.

i. Selection of the theme of the seminar and its sub-themes as well

ii. Venue (availability of physical facilities etc.), Date(s), and Time (duration of each session) must be decided and finalized well in advance.

iii. The panel of experts, chief guest to be and the participants must be contacted and informed well in advance and their availability and permission must be sought.

iv. The selection of the paper presenter/speakers must be based on the article submitted by them and their professional excellence. Such selected paper presenter has to be informed with the necessary regulations to be followed by them in the seminar.

v. A compendium of selected papers must be prepared by an expert committee.

Activities involved during seminar (seminar phase): Proper arrangement of physical facilities (Stage settings, Seats, Audio-Visual equipment, etc.) available for the participants of seminar must be ensured.

vi. Chief Guests, Chair persons of Technical session, Observers and Participants of seminar must be welcomed properly and also be encouraged for their active participation in the seminar.

Activities Involved in the Seminar Phase

In the seminar phase, care should be taken that things are happening properly and all the planned things are occurring step by step in the planned manner. For example, there must be a schedule or compendium showing the theme, subtheme, the duration and such information and it must be given to the participants before the beginning of the seminar. There must be proper assistance such as appropriate audio, video equipment such as public address system, overhead projector, LCD projector, etc for every speaker / paper presenter for smooth presentation.

At the end of the seminar session, it becomes imperative on the part of the organizer to recapitulate the things and present a summary of what have been the theme of the seminar, upto what extent it has been achieved and what are the conclusion or benefits drawn from this seminar for future course of action. A vote of thanks for the presenters as well as the participants should also be done at the end of the seminar to acknowledge the effort each one has put in organizing as well as participating in it.

Post seminar phase: The work associated with conducting the seminar does not end with the vote of thanks, rather a good amount of work is required to be done, such as, correction of the presented papers/articles for ambiguities and
also if they are meeting the standard and theme or not. The prepared compilation is sent to concerned institutes, firms, agencies for follow up activities. The compendium may also be given to the people of similar interest on request. Proper monitoring and finalization of accounts is also necessary for preparing a clear budget report that can be sent to the auditing committee/officers for approval and essential actions.

**Advantages of Seminar Method**

i. Seminar method is learner centred and supports the tenets of constructivism.

ii. Learners co-construct their knowledge along with the peers or other more knowledgeable people.

iii. Provides self-structured learning chance since the learner themselves monitor and analyse with the help and support of the experts.

iv. Encourages learning by doing.

v. Reinforcement is also there in the seminar method which makes the learner much more interested and enthusiastic in achieving the objectives.

vi. Learners can structure their own learning as the teacher or chairperson of technical session plays the guidance and instructional role.

vii. Helps in developing cognitive, affective domains based learning.

viii. Helps in understanding and developing norms of behaviour and their reinforcement.

ix. Participants also develop the attitude of open mindedness as they are able to appreciate and recognize the views of the others.

x. Vivid discussion, interactions and interrogations, the spirit of seeking information is also developed and encouraged.

xi. Helps in developing and inculcating the data processing skills, compilation skills, communication skill and other higher order thinking abilities as well.

xii. Also helpful in providing in-depth knowledge regarding a particular event or topic or any such matter of discussion as it provides a platform for holistic, healthy and intellectual discussion.

**Disadvantages of Seminar Method**

i. Not possible to conduct seminar for each topic.

ii. Subject area to be taught must be relevant to the theme of the seminar.

iii. Utmost care needs to be taken to confirm the learning experiences aimed to be inculcated in the students as it must match with the theme of the seminar.

iv. More fit for higher classes; implementation of this method in lower classes is not feasible.
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v. Involves high level of patience and thinking as it demands high level of maturity and balanced mindedness from the teachers.

vi. Teacher must be resourceful (both in academic and administrative) in nature if the course is to be covered in the stipulated time as time management becomes difficult with this method

5.3.4 Conference Method

The term conference when used as a noun means a formal meeting for discussion. In the realm of teaching and learning, conference, seminar, group discussions, symposiums are different ways of providing instruction by making students participate actively in the teaching learning process.

At a conference, discussions are held, innovative ideas are thrashed and new information is exchanged among experts. It can be a national conference for discussing some issues of national concern, international conference in which matters of international arena are discussed and sorted, a video conference in which even if the participants are not at one place they can be contacted through video, an academic conference which is a gathering of scientists or academicians, where research findings are presented or a workshop is conducted and so on. Presentations are done in conferences on the issues decided prior to the conference. Conferences can also be themed conferences or general conferences. Themed conferences are organized around a particular theme while the general covers much broader areas and aspects.

5.3.5 Symposium

Symposium is among the higher teaching learning processes. It is also an instructional technique which is used to achieve higher cognitive and affective objectives. The history of the word symposium is quite interesting as the word was earlier used in a different sense. Plato used this term for good dialogue to present views towards God. In fact, there are also several meanings of the term symposium, one being intellectual recreation or enjoyment. However, in the present context we are using this word in terms of meeting of people to discuss a problem or theme. The definition of the term symposium can be as follows:

- Symposium technique/forum provides a platform for exchange of ideas and in a way act as an instrument for informing audiences
- Crystallizing opinions and arriving at concrete outcomes for drafting policies highlighting values, making judgments and developing understanding

The main purpose of the symposium is to make students and listeners able to comprehend a particular theme or problem in great detail with an attempt to cover all the possible aspects.

Objectives of Symposium

- Develops an understanding of the various aspects of theme or problem.
Helps in developing the ability to make decisions and judgements regarding any issue as they provide in-depth details
Develops values and feeling regarding a problem
Helps in forming policies regarding a theme or problem

Mechanism of Symposium Technique
Symposium can be said to be a form of discussion in which a problem or idea or issue is discussed in detail. A problem or issue or an innovative idea may be presented by an individual covering all the aspects and then it is followed by an open discussion in which the topic is thrown open for discussion, suggestions, and recommendations.

The chairman of the symposium introduces the topic, suggests something of importance, and sometimes indicates the general approaches. In fact it can be said that symposiums serve as an excellent device for informing audiences, crystallizing opinion and in general preparing the listeners to decide policies, value judgment or understanding.

Three conditions are used in the symposium technique:

i. Firstly, the organizer must make sure that the speaker is ready and is aware of the rules and procedures of speaking and the way in which the forum is going to be conducted. The listeners and audiences must also be aware of the theme of the discussion and have some background knowledge.

ii. Secondly, the chairman or whosoever is responsible for preparing the agenda, should not attempt to stack the cards by omitting or ignoring vital problems while selecting or delegating speakers.

iii. Thirdly, the chairman in all the forum situations must plan very carefully the questioning period that follows the prepared speeches.

Scope for the Use of Symposium Technique
The symposium technique can be used to realize the higher cognitive and affective objectives. The following can be the main topics on which symposium can be conducted and used:

- Use of television for education
- Scope of distance education in our education
- Use of essay and objective type tests
- Semester system in education
- Causes of students’ unrest
- Quality control of educational research
- Use of micro teaching in teacher education
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- Use of team teaching in schools
- Use of action research in classroom teaching
- Scope of education technology in our education

The nature of the topic should be such that the audience should be interested in the theme.

Characteristics of Symposium Technique

The symposium technique has the following main characteristics:

i. Helps in developing an insight for the problem by providing in-depth understanding of a topic or a problem.
ii. In symposium methods the listeners also get an opportunity to take decision about the problem.
iii. It is generally used for higher classes for specific themes and problems.
iv. It develops the feeling of cooperation and adjustment.
v. The higher order objectives such as of synthesis and evaluation (creativity) can be achieved by employing the symposium technique.

Limitations of Symposium Technique

This technique suffers from the following limitations:

i. The chairman has no control over the speakers.
ii. The presenter can present any aspect of the theme or problem.
iii. Different aspect of the theme are presented simultaneously and at once. Therefore the listeners may get overburdened with a totally new ideas at once and may not able to understand the theme correctly.
iv. While the presentation continues the listeners remain passive in the symposium. They are given opportunities to seek clarification and put questions after presentation but this may lead to slip of any crucial question on the part of listener which suddenly pops up on listening to some aspect of the presentation and might lose its relevance at the later time.
v. The discussion and presentation of theme, is not summarized at the end. The participants take decision according to their own. Hence only mature people can make use this technique.
vi. This technique is employed to achieve the higher objectives.

5.3.6 Brainstorming Method

According to Ekwall and Shanker, author of Reading Inventory (1988), people only learn 20 per cent of what they hear, but they learn 70 per cent of what they say as they talk and 90 per cent of what they say as they are engaged in doing something. This makes the strategy of brainstorming i.e. having a group discussion
to produce ideas a necessity in the present educational scenario if one want students to comprehend and remember the content and compete in the world arena.

When students have opportunities to brainstorm ideas with their peers without the fear of criticism, then it will increase their comprehension and higher-order thinking skills. Therefore, brainstorming becomes a necessity in teacher education. Student teachers need to be made to have group discussion and generate ideas in the teaching learning context so that they can also use the same to deal with their students in the classroom. One of the most powerful ways that students process new information is to talk about it with their peers. When used as a formative assessment strategy and students are engaged in collaborative conversations, discussion supports many of the common core state standards, such as speaking and listening (McLaughlin & Overturf, 2013).

Brainstorming makes use of an informal approach to problem solving with lateral thinking. That is it can be referred to as a mind tool. It helps people to come up with thoughts and ideas that can be apt or may seem useless. With discussion some of these ideas can be crafted into original and creative solutions to a problem, while others can spark even more ideas. This gives a broader arena to think in different ways towards a problem going beyond normal ways of thinking. Therefore, it is suggested that during brainstorming sessions, student teachers should not or in fact should completely avoid criticizing or rewarding ideas. In brainstorming the approach is mainly to open up the possibilities towards approaching a problem and moving beyond the assumption of the limit of a problem. There can be various ways towards a problem and not a single way is final and correct. Judgement and analysis are not done in brainstorming since this can hinder creativity and generation of fresh, unbiased and innovative ideas.

Brainstorming can be:

- Individual brainstorming
- Group brainstorming

i. Individual brainstorming: When we try to see group brainstorming and individual brainstorming together it will become evident that as compared to normal group discussion brainstorming sessions are more effective.

However several research findings supports that individual brainstorming yields better results more often than group work. The reason behind this may be the fact that in group brainstorming there are chances that there might be bad behaviour and in the process hamper the overall discussion.

Sometimes people become so critical and focused on other peoples’ ideas that they are unable to generate their own creative ideas which results in ‘blocking’. This may result in having a negative effect on the brainstorming process rather than having a positive one. In individual
brainstorming there is no point of worrying about what the other person is thinking or not thinking, one does not have to worry about the egos or opinions of others, and thus it can be said that it enhances freeness and is more creative. However, one of the major shortcomings of individual brainstorming is that one does not have a wide arena to think of taking into cognizance the viewpoint of others as well. So this may result in narrow vision towards an idea and thus may affect the outcome negatively.

**ii. Group brainstorming:** Group brainstorming allows one to have access to a vast repertoire of ideas and creativity. In this type of brainstorming if one person or member of the group gets stuck at one point then the other members can break the limit and can impart a different dimension. So, it can be said that the ideas generated through group brainstorming have greater depth than individual brainstorming as there are chances of viewing various perspectives and dimensions.

In group brainstorming there is also the aspect of feeling of self-content as it helps everyone to feel that they have contributed to the solution. It also reminds contribution of others as well. Group brainstorming also helps in developing team feeling and can be a way of solving a problem with ease and without much tension. However, group brainstorming requires proper and disciplined way of approaching the problem as absurd suggestions may also appear lacking in-depth knowledge and value. This may result in deviation from the main point. This needs to be controlled and taken care of.

People from different arenas help in generating diverse ideas and in generating a disciplined approach. To use brainstorming as an instructional strategy in the teacher education the following steps can be followed:

**Step 1: Preparation of the group:** The preparation phase is the most crucial one. It is correctly said that ‘well begun is half done’ and it also applies in conducting a brainstorming session. Preparation phase involves taking into consideration several things like when and where the brainstorming session can be conducted. For example, while teaching how the teacher educator can use a context or topic to start brainstorming.

**Step 2: Presentation of the problem:** The problem or the direction towards which the discussion has to be taken should be clearly defined since there are ample chances of deviating from the proposed or desired discussion in group discussion.

**Step 3: Guidance to the discussion:** This is a very important step in brainstorming session as there are chances of getting deviated and also chances of hurting or not giving attention and importance to ideas of others and just emphasizing one’s own without taking others perspectives. So overall it can be said that there are shortcomings to this approach such as:
- It is time taking
- Can result in deviation i.e. moving away from the desired discussion
- Can cause one to have low self-esteem if one does not find that one’s idea is not being appreciated

But in spite of all this, brainstorming has great potential of developing higher order thinking skills and thus can be termed as an apt method to be used in teacher education curriculum for making prospective teacher think and analyse things taking a broader perspective and approach and giving weightage to all the ideas.

Overall it can be said that proper management, fostering of creativity, lack of criticism and judgments are the key aspects of brainstorming technique. This technique may prove to be very helpful in finding radical solutions to problems if managed properly. A synthesis of individual and group brainstorming sessions can be a better approach to deal with an issue.

5.3.7 Supervised Study

Supervision is a very important aspect of student-teaching. Supervision means to stimulate and direct the growth of student teacher. It consists of the guidance and evaluation of the activities of student teacher. The right type of supervision is crucial to make an efficient and effective teacher. The supervision of Student-Teaching brings the improvement in instructional activities of student teacher by familiarizing with various techniques and practical skills in teaching.

The purpose of supervision is the improvement of instruction objective in teaching learning process.

In the teacher education programme, the supervisory organization for practice teaching and the supervisory techniques and practice aimed at bringing improvement in the instructional activity of the student teachers by familiarizing the student teachers, on the one hand, with various techniques and practical skills in teaching on the other. This helps to develop confidence in facing the classroom situations by the student teachers. Supervision before classroom teaching aims at guiding the student teachers in planning their lessons. They have to learn to organize contents of their teaching, formulate suitable gestures to evoke right responses from the students, and develop other related abilities and skill that enables a teacher to enter the classroom and face the students confidently. In the existing situation, the students are asked to prepare the lesson-plans themselves without telling them the proper procedure. The lesson plans are checked superficially and no discussion is done with the subject expert. The students are free to enter the classes without having any type of previous knowledge of facing classroom situations.

Supervision during the classroom teaching is generally exercised by the teachers of training colleges. The training colleges arrange a team to supervise the student teacher while teaching in a school. The team of supervisors may or may not relate from one school to another. The teaching of student teachers is supervised...
by the teachers who may or may not be method specialist. Therefore, the student teachers tend to receive a general supervision from the college supervisor who are often neither subject method specialist nor have been active school teachers of the concerned subject. These supervisors mostly offer descriptive type of criticism, though constructive type of criticism is desirable one. These remarks are related to the general personality of the student teachers.

The supervisor seldom critically appreciates the knowledge of the student and the order of its presentation to the students. The supervisors fail to supervise all the lessons taught by a trainee and in many cases not more than 25 per cent of the lessons are being supervised. The percentage of lessons supervised by the subject method specialist varies from 5 per cent to 25 per cent of the lessons taught by student teachers. The reasons for the lack of supervision and faulty staffing pattern results in shortage and non-availability of the subject method specialist, uneven distribution of teaching subject among the student teachers, lack of time and too many lessons to be supervised in a class period, i.e., ratio of student teacher-teacher education is inappropriate, defective time table, etc.

It is suggested that the supervision of student teachers should be the joint responsibility of the college faculty-represented mainly by the method master and the school teachers. Major share of responsibility in this enterprise should rest with the school teachers because the supervision of student teaching requires more than simply the art of teaching. To guide and appraise the student teacher, the supervisor must obviously have a more thorough understanding of the subject and of such educational discipline like psychology. The school teachers should be assisted in their work of supervision of student teacher by the college supervisor of the student teacher. Frequent conference and consultations between them will not only help to relate them to practice, but will also help the student teachers to improve their performances in a realistic school setting.

The things that need to be taken into consideration in the supervision technique have been explained below.

Organization and Supervision of Student-Teaching

For smooth and successful implementation of student teaching programmes, supervision is necessary. It is essential to realize the objectives of student-teaching. A functional programme of student-teaching offers a challenge to the student teachers for acquiring and understanding of the fundamental teaching-learning process, the knowledge about the problems of actual teaching and a mastery of skill for directing the learning of student teachers. Student-teaching is the key phase in the total teacher education programme where attempt is made to prepare the student teacher of their multifarious responsibilities of a teacher. Many arrangements for the orientation of student teacher are necessary. All these things require proper organization. Without proper organization of student-teaching, the programme of teacher preparation will not be successful.
The quality of teachers play a very crucial role in the success of overall education system and thus it can be said that the teacher education institutions play an essential role in the educational arena of our country. Student-teaching is recognized as the most important aspect of the preparation of teachers. Student-teaching is the nucleus of any pre-service teacher training programme. Thus, every training institution should organize and make provision for the supervision of student-teaching adequately. In student-teaching, the student teachers get an opportunity to gain practical experiences of many useful things that they learn in theory classes. While organizing an effective programme of student-teaching, some of the important aspects that need to be considered are as under:

- **A series of general lectures**: Before the student teachers start actual teaching in schools, it is necessary to give them a general background of some significant spheres of teaching so that they may be mentally prepared. They should be aware of teacher education aspects such as professional courses, professional growth of teachers, place of curricular activities, and human relations in schools. They should also be taught about the use of library, components of successful teaching, maxims to teaching, methods of teaching, types of lessons, use of teaching aids, class management strategies, planning of units and individual lessons.

- **Demonstration lessons**: The main purpose of demonstration lessons is to expose the student teachers to certain teaching situations. By observing the lessons of good and experienced teachers, student teachers can get an opportunity to examine the points critically which they have learnt in theory. Demonstration lessons should be organized before practical teaching as student teachers might face some difficulty during practice teaching. As for the number of lesson in each method of the subject, it seems worthwhile to have at least twenty-five lessons each. The demonstration lessons should preferably be delivered in the training colleges rather than in the schools. Each demonstration lesson and some of the practice teaching lessons should be followed by discussion by staff and the students. The demonstration lessons may either be imparted by Training College Staff or by Effective School Teachers.

### Current Procedure of Supervision

The programme of supervision of Student-Teaching is arranged in all teacher education institutions in two stages:

- **Before actual classroom teaching begins**
- **During classroom teaching**

**Supervision before Classroom Technique Begins**: All teacher education institutions require their student teachers to prepare their lesson plans and get them thoroughly discussed and checked up by the subject specialist and make
necessary modification in their lesson plans before they are permitted to teach their lessons to their students in the class.

1. Supervisory Personnel: The main responsibility of supervision falls on teacher educators. The faculty is involved in the supervision of student-teaching. The Regional College of Education employs three groups of personnel for supervision in the internship activities of student teachers:
   - Subject teacher from the concerned subject department of college
   - Pedagogy experts from the college education department
   - Cooperating teachers and headmasters/ principals of the cooperating schools

2. Arrangement for Supervision: The arrangement for supervision of student-teaching in colleges and departments of education, other than the Regional Colleges of Education, is not so well defined and varies from institution to institution. The following are a few of the practice of arranging supervision of student-teaching:
   - Assigning a supervisor to each practice teaching school. The supervisors are generally regular supervisors. Some institutions insist that supervisor of practice teaching should rotate from one school to another school on a daily weekly or bi-weekly basis.
   - Some institutions arrange a system of team supervision in place of one permanent supervisor.

A Critical Study of the Current Procedure of Supervision

The current procedure of supervision varies from institution to institution.
   - The supervisors seldom critically supervise the lesson.
   - The supervision work is being done mechanically. The supervisors are unable to supervise the lessons thoroughly.
   - The percentage of lesson supervised by the subject specialist is very low.
   - The practice teaching is done very hurriedly.
   - Non-teaching work is rarely done.
   - The supervisors are not interested in supervising co-curricular activities.

Need of Supervision of Student

A trainee needs the help and guidance of teacher educators. Student teachers have to learn to plan their lesson, organize the contents of their teaching in a logical and coherent way according to the level of the students. Learning of all this is not an easy task. In-fact teaching is both an art as well as science. So it cannot be learned or acquired through bookish knowledge. Rather in the realm of teaching
The learning process requires incorporating the intricacies of art as well as the innovativeness of science, so it demands proper supervision and care.

**Relationship between Organization and Supervision**

Both organization and supervision of student-teaching aim at improving the instructional activities of student teachers. Proper organization of supervisory activities is necessary. The success of supervision depends not only on the skills and competency of supervisory personnel but also on the organization in which it is being operated. The process of organization should also be supervised. The success of organization process depends on proper supervision. Thus, in this sense, they are interrelated. Both are very important and essential aspects of student-teaching.

**Suggested Plan for Supervision**

Following are some of the suggestions that can improve supervision.

i. The procedure of supervision should be well defined and the variations should be minimized.

ii. It is desirable that supervision should be done in such a way that the objectives of student-teaching may be achieved. The student teachers should give 20 to 30 per cent lessons in each of their subjects, 50 per cent to 75 per cent lessons should be supervised and 40 per cent to 50 per cent lessons should be checked before delivery, 30 per cent to 25 per cent lessons should be supervised by the subject specialist.

iii. Supervision in the beginning should be more regular because the student teacher needs help and guidance. It should be reduced in quantum. Whenever new techniques are applied, supervision will have to be more thorough and wholly guidance oriented. Supervision of every lesson is not necessary. A long list of weaknesses discourages and retards the total progress. Supervision should be done for supervision’s sake only.

iv. It is also suggested that supervision has to become diagnostic in nature. A student teacher should be closely supervised by a team of two or three supervisors, who should highlight all the strong and weak points of the student teachers.

v. The supervision should be scientific and creative. New techniques of supervision should be adopted. Once suggestions have been given, the task of supervisor is not over. It is the duty of the supervisor to let the student teacher know about their weaknesses and how they can improve and overcome them.

vi. It may be useful to organize a common monthly half day meeting of all the student teachers and supervisors, where points of common interest may be raised, discussed and clarified.
vii. Performa and check-lists are very important and useful for systematic supervision. These performa and check-lists should be available to the student teachers as well, so that they may know the nature of good lesson. In brief, student-teaching is an essential aspect of the whole teacher education programme.

5.3.8 Individualized Study

Individualized instruction is an instructional method that takes place or made to occur according to the needs and learning styles of the learners. Various ways can be used to give individualized instruction. Some of them are as follows:

- Varying the pace of instruction according to learners levels and needs
- Employing different method of teaching and learning according to the cliental
- Choosing the content to be learned according to the student’s levels and needs.

As a matter of fact individualized instruction is different from one-to-one instruction. It deals with the processes to meet the needs of each individual learner in the group with the aim to provide them the opportunity for self-paced learning.

The various ways that has been mentioned above are being discussed here one by one.

i. By varying the pace of instruction Individuals can be made to study at their own pace. There can be different type of individuals in a class and among student teachers so individualized instruction helps in providing instruction to each according to their needs. In a classroom there are students with different learning styles or have different pace of understanding or students can be at different level of understanding in different subjects so varying the pace of instruction proves to be helpful.

ii. Use of carefully selected instructional material also helps in providing individualized instruction. As a matter of fact individuals with different learning styles may use and need different materials to study similar content. Those who learn best through listening may use materials with a strong audio component, while visual learners may use a more traditional textbook, or materials with a video component.

iii. Technology also can be used as a means to accomplish the task of providing individualized instruction. A good way to accomplish this by using technology can be Computer-based instructions, as it often uses a multimedia approach that is useful with a variety of learning styles.

iv. In case of individualized instruction, the quality of the instructional materials also becomes extremely important. The materials must fully explain the things in detail thus reducing the dependence upon the instructor. The materials must be designed with proper care keeping
in mind that when the learner reads or uses it, is able to do it on their own.

v. By varying the content material according to the interest and strengths of the learners, the desired end can be achieved. Once basic required content has been learned, individuals can be free to pursue additional learning within the subject according to their interests.

So overall it can be said that this method of teaching learning has immense potential for developing interest of student teachers towards teaching learning process. Student teachers can be made to study and choose their area of interest and then follow the teaching learning process. As a matter of fact individualized instruction along with these advantages has certain disadvantages as well. Some of them are:

- Not possible to provide individualized instruction to large number of student teachers at once.
- Individualized instruction is also a time taking process on the part of the teacher as well as the taught since it requires preparation to present the content taking to consideration learners level and needs.

5.3.9 Action Research

Going by its literal meaning it can be said that the term action research is a verb and it refers to studies carried out in the course of an activity or occupation. Some definitions of the term:

‘Action research is a form of investigation designed for use by teachers to attempt to solve problems and improve professional practices in their own classrooms. It involves systematic observations and data collection which can be then used by the practitioner-researcher in reflection, decision making and development of more effective classroom strategies.’ (Parsons and Brown 2002)

‘Action Research is a fancy way of saying let’s study what’s happening at our school and decide how to make it a better place’ (Emily Calhoun 1994)

‘Action research is a natural part of teaching. Teachers are continually observing students, collecting data and changing practices to improve student learning and the classroom and school environment. Action research provides a framework that guides the energies of teachers toward a better understanding of why, when, and how students become better learners.’ (A. Christine Miller 2007)

Calhoun proposed five phases of action research:

**Five Phases of Action Research**

1. **Selection of an area:** In the first phase of action research an area is selected to focus upon or work upon.
2. **Data collection:** After deciding the area of the action research data collection is done forming the second phase of the action research process.

3. **Organizing data:** The next step after data collection is organization of data. The data can be organized in the form of tables or charts or any suitable way depending upon the type of data.

4. **Analysing and interpreting data:** After organization of data the next step which follows is data analysis and interpretation. Data analysis and interpretation forms an important aspect of any type of research including action research.

5. **Taking action:** Analysis and interpretation of data helps in arriving at a conclusion. On the basis of conclusions drawn the plan of action can be prepared and with the proper time and scenarios they can be implemented as well.

So, basically action researches are done for immediate problems for example, classroom problem of less attendance. It can be used to solve the problem by arriving at the conclusion and implementing the best possible way to solve the problem as obtained through data analysis and interpretation.

### Ways of Conducting Action Research

There can be several ways of conducting action research. Such as:

- By observing individuals or groups
- By using audio and video tape recording
- By using structured or semi-structured interviews
- By taking field notes
- Using or taking photographs
- Conducting surveys or questionnaires

There are also various types of action researches that can be conducted to achieve the desired end. These are:

- Individual action research
- Collaborative action research
- School-wide action research

In individual action research the researcher works independently on a project. Examples of individual action research include an elementary school teacher conducting her own in-class research project with their students. In collaborative action, a group of teachers or researchers work together to explore a problem that might be present beyond a single classroom, perhaps at the departmental level or an entire grade level. Action researches covering or dealing with issues pertaining to entire school or district are referred to as school wide action researches. In this type of research teams of staff members would work together using school-wide action research.
In order to explain action research in detail and to aid in understanding comprehensibly, two examples of action researches are being explained. The first example discusses observation as being the method of choice for collecting data in the classroom. The second example discusses using surveys as the method of choice for collecting data.

**Example 1: Individual Action Research using observation as technique for data collection**

**Step 1: Identification of the Problem:** A 5th grade teacher identified a problem in his/her classroom. The problem was that the students do not have much experience of working in task groups, and the teacher believes that they need to have more opportunities to do so. The teacher tried to assess the skill set of the students and observe their overall approach to group work since by doing this, the teacher will have some new insight into what works well and what needs improvement regarding conducting group work in the class.

**Step 2: formulation of a Plan:** As a plan for action research the teacher will decide to make students work in group for the next project. This helps in getting an insight towards ways of working of the students, how they interact among themselves, how they approach a problem, what strategy they are adopting, how they are approaching the issue collectively, how they are planning division of work among themselves and so on.

**Step 3: Implementation of the Plan:** Implementation of the plan involves dividing the class into groups and then making them do the project.

**Step 4: Observation of the Groups:** This is observation and data collection phase. In this phase the teacher observes students while discussing the issue, takes notes, tries to observe how students brainstorm, and how they are approaching the things. Whether there is proper team work or some students are arguing and making things negative by not cooperating. All these things are observed by the teacher and a note of things are made to help in analysis and interpretation which has been termed as reflection and sharing.

**Step 5: Reflection and Sharing:** This is the final step in the present action research process. In this stage as note of things has been taken the teacher reflects on the situation and aspects of team work by analysing the data collected and arriving at conclusion as to whether the strategy adopted worked well or there is need to do some more action research.

Action research is an attractive option for teacher researchers, school administrative staff, and other stakeholders in the teaching and learning environment to consider.

In a way it can be said that action research leads to or facilitate teacher empowerment as teachers are able to collect and use data in making informed decisions about their own schools and classrooms. Within the classroom, empowered teachers can implement practices that best meet the needs of their students.
students, and complement their particular teaching philosophy and instructional style. Action research makes students lifelong or we can say continuous learners as teachers are made to explore the possibilities of solving classroom or student related problems by becoming a part of the system. They get opportunities to explore new ways, ideas, practices, understand the dynamics of their classroom, reflect on and be creative.

### Check Your Progress

4. **What are the main uses of instructional strategies?**

5. **What are the disadvantages of the lecture method?**

6. **Name the types of seminars.**

7. **Name the types of brainstorming.**

### 5.4 Answers to Check Your Progress Questions

1. **The principles of observation as mentioned by Flanders are the following:**
   
   i. No interaction analysis data should be collected unless the person is familiar with the entire process and knows its limitations.
   
   ii. Questions to be answered by inspecting the matrix should be developed before the observation takes place.
   
   iii. Value judgements about good and bad teaching behaviour are to be avoided.
   
   iv. Emphasis is to be given to the problem being investigated so that cause-and-effect relationship can be discovered.
   
   v. A consultation based on two observations or at least two matrices helps to eliminate value judgement or at least control them. Comparisons between the matrices are more likely to lead to principles.

2. **The precautions to be adhered while using the interaction analysis are the following:**

   i. Interaction analysis data should be collected only when the person is familiar with the entire process and knows its limitations.
   
   ii. Questions to be answered by inspecting the matrix should be developed before the observation takes place.
   
   iii. Value judgements about good and bad teaching behaviour should be investigated so that cause and effect relationships can be discovered.
   
   iv. A consultation based on two observations or at least two matrices helps in eliminating value judgements or at least in controlling them.
3. The Equivalent Talk Category System (ETC) System was developed by Ernest L. Bentley and Edith Miller at Atlanta in 1970.

4. The main uses of instructional strategies are the following:
   - Motivate students in focusing attention to achieve the desired goal or learning the desired thing.
   - Help students in organizing information for understanding and remembering the content.
   - Students can themselves keep track of their own learning.

5. The disadvantages of the lecture method are the following:
   i. Students are not active but are passive which may hinder learning. There is mostly one-way communication so students may also become hesitant and reluctant in presenting their views. Therefore, it is highly advised in the lecture method that the lecturer must make a conscious effort to become aware of the problems of the students and how much the students understand.
   ii. The students also need to devote a considerable amount of time for being able to understand the concept on their own if they are unable to grasp it through lecture and are hesitant to speak in class.
   iii. It is not mandatory neither a rule of the lecture method but the lecture depends to a great extent upon the speaking skills of the orator. Since to make the teaching-learning process interactive and engaging for students, lecture method puts a hidden demand on teachers to be good communicators.

6. The types of seminars are the following:
   i. Mini seminar
   ii. Major seminar
   iii. National seminar
   iv. International seminar

7. Name the types of brainstorming.
   The types of brainstorming are the following:
   i. Individual brainstorming
   ii. Group brainstorming

5.5 SUMMARY

- Classroom observation is a quantitative technique of measuring classroom behaviour. The behaviour is calculated from direct observations that recognize both the behaviour and events that are to be observed and how they are to be recorded.
One of the most significant functions of systematic classroom observation is to get better teacher’s classroom instruction by improving the lessons. Observational methods have shaped important information that has everyday inference for the enhancement of teaching practices.

The Flanders system is an observational tool used to classify the verbal behaviour of teachers and pupils as they interact in the classroom. Flanders instrument was designed for observing only the verbal communication in the classroom and non-verbal gestures are not taken into account.

Teaching is an interactive process which is mainly influence-directed. A teacher tries to influence the students.

The RCS was developed by Richard Ober of the University of Florida in 1967. This system is an adaptation of the Flanders system. It contains ten categories.

The Equivalent Talk Category System (ETC) system was developed by Ernest L. Bentley and Edith Miller at Atlanta in 1970. It is an outgrowth of their extensive work with the Reciprocal Category System (RCS).

Instructional strategies are a way or techniques used by teachers in order to help students learn. Thus, it can be said that these strategies help students in becoming independent strategic learners.

The lecture method is one of the widely acknowledged and most frequently used instructional strategies in the classrooms.

Workshop method is a way of providing instruction in which student teachers are given opportunities to work on their own.

Seminar method is an instructional technique. It can be termed as an instructional technique involving higher order thinking in which students involve in interaction among themselves on a theme.

Seminars are mainly conducted at higher levels since they require a certain level of understanding and ability of reflection and comprehension on the part of students.

The term conference when used as a noun means a formal meeting for discussion. In the realm of teaching and learning, conference, seminar, group discussions, symposiums are different ways of providing instruction by making students participate actively in the teaching learning process.

Symposium is among the higher teaching learning processes. It is also an instructional technique which is used to achieve higher cognitive and affective objectives. The history of the word symposium is quite interesting as the word was earlier used in a different sense.

Group brainstorming allows one to have access to a vast repertoire of ideas and creativity. In this type of brainstorming if one person or member of the group gets stuck at one point then the other members can break the limit and can impart a different dimension.
Supervision is a very important aspect of student-teaching. Supervision means to stimulate and direct the growth of student teacher. It consists of the guidance and evaluation of the activities of student teacher.

For smooth and successful implementation of student teaching programmes, supervision is necessary. It is essential to realize the objectives of student-teaching.

Individualized instruction is an instructional method that takes place or made to occur according to the needs and learning styles of the learners.

Going by its literal meaning it can be said that the term action research is a verb and it refers to studies carried out in the course of an activity or occupation.

### 5.6 KEY WORDS

- **Instructional strategies:** These are a way or techniques used by teachers in order to help students learn.
- **Workshop method:** It is a way of providing instruction in which student teachers are given opportunities to work on their own.
- **Symposium:** It can be said to be a form of discussion in which a problem or idea or issue is discussed in detail.

### 5.7 SELF ASSESSMENT QUESTIONS AND EXERCISES

**Short Answer Questions**

1. List the principle features of the Reciprocal Category System (RCS).
2. What are the limitations of the Equivalent Talk Category System (ETC)?
3. State the basic difference between instructional strategies and learning strategies.
4. Name the major instructional strategies used in the field of education.
5. What is the framework for a workshop model?
6. How is the seminar method used as an instructional technique?
7. What are the limitations of the symposium technique?
8. Write short notes on the following:
   (a) Supervised study (b) Individualized study
9. Mention the various ways of conducting action research.
Long Answer Questions

1. Discuss the observation schedules of classroom interaction.
2. Explain Flanders’s Interaction Analysis Category System (FIACS).
3. Prepare a comparative study of Flanders and the RCS System.
4. What are the criticisms raised against the lecture method of teaching in the classroom?
5. Describe the various phases of the seminar method.
6. ‘Symposium is among the higher teaching learning processes.’ Explain.
7. Analyse the use of brainstorming as an instructional technique.

5.8 FURTHER READINGS

UNIT 6 HARDWARE AND SOFTWARE

6.0 INTRODUCTION

Education has been benefited by technology in various ways and at various levels. From both, sociological and the economic points of view, technology has made an impact on education. Today, a number of institutions, in developed and developing countries, are offering courses through various communication technologies, such as interactive TV, computer conferencing, the Internet and other forms of media. Some of the distance education/open learning institutions in developing countries are also offering courses electronically. As a result, a large number of learners are pursuing their studies through technology.

This unit will brief you to the use of hardware and software in the field of education. Moreover, you will also get to study the merits and demerits of using CCTV, tape recorder, radio and projector from the educational perspective.

6.1 OBJECTIVES

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

- Discuss the hardware and software approaches to educational technology
- Define high and low technology
- Discuss the merits and demerits of CCTV, tape recorder, radio and projector
6.2 HARDWARE AND SOFTWARE IN EDUCATIONAL TECHNOLOGY

NOTES

Professor Henry Ellington (1993) opined that the key function of educational technology is to bring about improvements in the general competence and efficacy of the teaching–learning process. He further said that these improvements could be introduced in the following ways:

(i) By enhancing the quality and capacity of learning.
(ii) By reduction of the turnaround time for learners to achieve the assigned objectives.
(iii) By making teachers more efficient.
(iv) By cost-cutting without compromising on quality.
(v) By making learners capable of taking their own decisions.
(vi) By providing education in more flexible ways.

Considering educational technology as multifaceted in nature, Lumsdaine (1964) has listed its three distinct approaches:

(i) Educational technology I (ET1) or the hardware approach
(ii) Educational technology II (ET2) or the software approach
(iii) Educational technology III (ET3) or the systems approach

Hardware Approach

The hardware approach is the use of materials and equipment in the domain of education. Audio-visual aids, for example, charts, models, filmstrips, slides, audio cassettes and equipment like films, projectors, radio, record player, television and computers fall in the category of hardware. The hardware approach is based on the application of principles of physical sciences and engineering to education and training. In this system, the teaching process is being mechanized gradually so that maximum pupils may be educated in minimum time and at low costs. This approach is a by-product of the scientific and technological developments of the 20th century.

It is to be noted that teaching machines are the only mechanical aids deliberately designed and invented to fulfil instructional requirements. All other audio-visual aids were designed and manufactured for improving the communication system, but now they are being used for instructional purposes.

The mechanization is being introduced for preservation, transmission and advancement of human knowledge. For instance, a teacher can deal with a large group of students by his discourse on radio or television. Thus, educational and training systems are able to deal with an increased number of students and the cost per student has been reduced by the hardware approach to education.

Silverman (1968) referred to this type of educational technology as "relative
technology’. This comprises borrowing and applying technology, machines and devices in the process of teaching and learning. In this context, educational technology serves a simple ‘service’ function in education.

Ivor Davies calls this approach the ‘Audiovisual Archetype’. This approach stresses on the employment of machines, devices, equipment and similar instructional aids. This approach focuses on the teacher and his/her teachings. “Technology is seen as a means of mechanizing or automating the process of teaching with devices that transmit, amplify, distribute, record and reproduce stimuli materials and thus increase the teacher’s impact, as well as widen potential audience” (Davies, 1978). In the beginning, media had developed this approach during the 1930s. It gained prominence during the post-World War II period. According to Davies, this ‘audiovisual archetype’ considers audio-visual hardware to perform functions like supporting classroom presentations, improving demonstrations by giving access to reality or simulations of reality, etc. It is not possible for a teacher to come up with these, within a short span of time. Nevertheless, this approach has faced several criticisms for the lack of coordination in its application.

Characteristics of hardware are as follows:

- Hardware components are generally electronic and mostly depend on mechanical systems.
- New techniques and researches are being conducted to evaluate the effect of hardware.
- The outcome of hardware is direct and immediate because of its concrete form.
- Hardware components are the media of communication.

The Software Approach

The software approach or software technology of education owes its origin to behavioural sciences and their applied aspects concerned with the psychology of learning. It originated from the engineering efforts of Skinner and other popular behaviourists. According to Arthur Melton (1959), software teaching is directly related to psychology of learning, which comprises behavioural changes resulting from experience. This view of educational technology is associated with modern principles and theory of teaching, models of teaching, theory of instruction, and theory of teacher–behaviour and principles of programmed learning. The components of software technology are closely associated with the modern principles of programmed learning, such as the following:

- Task analysis
- Writing objectives in behavioural terms
- Selection of appropriate instructional strategies
- Reinforcement of correct responses
- Constant evaluation
Leith observed that, ‘educational technology is the application of scientific knowledge about learning and the conditions of learning to improve the effectiveness and efficiency of teaching and learning’. Silverman (1968) termed software technology as constructive educational technology due to its constructive nature. Its basic educational applications are in the analysis of instructional problems, selection or construction of measuring instruments required to evaluate instructional outcomes and construction or selection of strategies and tactics to produce desired educational outcome.

Ivor Davies, names this approach as the ‘Engineering Archetype’, which applies the principles of behavioural science for the betterment of learning. Despite the use of hardware, this approach focuses on the learner and the learning. Therefore, it is called the software approach. ‘Technology is seen as a means of providing the necessary know-how for designing the new, or renewing the current, worthwhile learning experiences. Machines and mechanization are merely viewed as instruments of presentation or transmission’ (Davies, 1978).

It was in early 1969 that software approach initially developed in the area of programmed learning. It was the outcome of Skinner’s efforts on operant conditioning. In the beginning, this approach found its application in the design of materials having sequential content. Soon after, it was widely used as part of curriculum and for developing courses. Based on the engineering approach, it takes the form of a series of steps to be followed. These steps comprise a statement of inputs and definition of objectives, intermediate steps which examine and select instructional strategies and resources and a terminal step of evaluation and output. This process always includes feedback. Though conventionally, ET1 went aboard after ET2, it is not to be regarded as a successful version of ET1. The development of both versions was independent and they still exist.

Significance of software and hardware

The significance of software and hardware in education are as follows:

- They cater to individual differences of students.
- They contribute to the economy of time, energy and resources of teachers and students.
- They bring clarity and vividness to the subject matter.
- They help to motivate students.
- Their help in developing and sustaining the interest of the students.
- They make the subject matter interesting, attractive, inspirational and effective.
- They provide for active participation of students.
Check Your Progress
1. What is the hardware approach to educational technology?
2. When did the software approach to educational technology develop?

6.3 HIGH AND LOW TECHNOLOGY

The term ‘low technology’ stands for technology that is designed to be as simple as possible. Its advantages include easy deployment, inexpensive and practical. The term ‘high technology’ refers to new technology with advanced features which keeps coming up with the advancement in science and technology. Undoubtedly, its advancement is its main attraction, however, it is expensive and difficult to maintain. In this section, you get to study few of the high and low technologies.

6.3.1 CCTV: Merits and Demerits

CCTV stands for closed circuit television. It is the most commonly used security system. A CCTV system is made up of single or multiple cameras, recording device and a monitor. The system can be wired or wireless. The CCTVs are used at homes, stores, banks and lately are also being used in the educational system not only for security reasons but also to improve and bring transparency in the teaching–learning process.

Let us now study its merits.

i. Helps in checking immoral behaviour: If the students know that they are being watched, there are chances that they may behave in a better way. This might also help in reducing and preventing the cases of bullying, intimidation and ragging in schools and colleges. Besides, behaviour of teachers and other school authorities can also be checked.

ii. Teachers: Teachers can use the footage of CCTV to improve their teaching as they can get to see on which aspects they need improvement. The issues of effective classroom management can also be addressed going through these footages. Thus, CCTV can help in improving the teaching-learning process by guiding the teachers as to where to improve in planning, implementation and evaluation process.

iii. Security: Crimes in and around the schools are increasing day by day. Hence, installation of CCTV is necessary as well as effective in improving the security of the school premises. They not only help in reducing crimes but also help in knowing the cause of crime.

iv. Beneficial to parents: Parents can also see what their wards are doing in school. In case of any disciplinary complaint of the students
the parents can be shown the footage. Besides, it also acts as a check on the teacher as they cannot physically and mentally harass the child. Thus, it provides a feeling of security to the parents.

Let us study its demerits.

i. **Privacy:** The installation of CCTV in the classrooms can be said to infringe the right of privacy of both teachers and students.

ii. **Lack of trust:** Installation of CCTVs in the classrooms means that there is no faith and confidence between the teachers and parents, school and parents and school authorities and teachers.

iii. **Effect on performance:** Being constantly watched may affect the teaching performance of the teachers. Being under constant pressure of being watched may not only affect their teaching but also health and behaviour.

### 6.3.2 Tape Recorder: Merits

An audio tape recorder, tape deck, reel-to-reel tape deck, cassette deck or tape machine is an audio storage device that records and plays back sounds, including articulated voices. It usually uses magnetic tapes, either wound on a reel or in a cassette, for storage. In its current form, it records a fluctuating signal by moving the tape across a tape head that polarizes magnetic domains in the tape, in proportion to the audio signal. There are many types of tape recorders in existence, from small hand-held devices to large multi-track machines. A machine with built-in speakers and audio power amplification to drive them is usually called a ‘tape recorder’. If this machine does not have the record functionality, it is a ‘tape player’; while one that requires external amplification for playback is usually called a ‘tape deck’ (regardless of whether it can record).

The invention of tape recorder has brought about a revolution in the teaching–learning process. Its main function is recording and reproducing of sound. Microphone, amplifier and reproducer are its three parts. It is an instrument which is used to record speeches, songs, music, etc. It may be played back at any time and any number of times. Teaching with tape recorder is an extension of a teacher’s work.

The educational utility of tape recorder in education has been highlighted in the following points:

- There is no fixed time schedule for tape recorded programmes and thus, no changes are required in the school timetable. It can be used anytime and anywhere.
- It helps in supplementing the educational output of radio and television broadcasts and guest lectures.
- Recorded educational programmes can be used for instruction in schools and colleges.
- It helps students in developing oratory skills by repeated practice. Further, it helps in overcoming poor speech habits and correcting speech defects.
- Tape recorders are immensely used in developing conversation skills, expression power and techniques of dramatization.
- They are significantly used in teaching specific subjects like music, dramatics and language.
- They are also used in organizations for conducting and evaluating various co-curricular activities.
- They may help in modification of behaviour and for encoding classroom events.
- They can supplement other educational tools like projectors, video players, etc.
- A tape recorder is very easy to operate and useful in group teaching as well as individual learning. It is also easy to erase a recording, if not required.

6.3.3 Tape Recorder: Demerits

The demerits of the tape recorder are the following:

i. A tape recorder is sensitive to changes such as temperature and humidity. If the machine is moved from a cold to a hot place there could be condensation of moisture on the internal parts of the machine which could adversely affect its functioning.

ii. The magnetic tapes used can be damaged when ejected from the machine due to moisture or technical reasons.

iii. Rubber drive belts and rollers harden with age, causing malfunctions.

From educational point of view:

i. There is no personal contact between the listener and the speaker. It is a one-way communication.

ii. Listening for a long time may distract the learner. It may even become monotonous and boring.

iii. It encourages passive learning when we talk about child centred learning.

iv. It does not provide practical experience.

6.3.4 Radio: Merits and Demerits

Radio basically transmits signals through free space enabled by modulation of electromagnetic waves having frequencies lower than visible light. This is done by oscillating electromagnetic fields that pass through air and the vacuum of space, which makes electromagnetic radiation travel. By systematically changing (modulating) some property of radiated waves, such as amplitude, frequency, phase, or pulse-width, information is carried from one place to another. The oscillating
fields induce an alternating current in the conductor, when radio waves pass an electrical conductor. This can be detected and transformed into sound or other signals that carry information.

According to Butcher (2003), “radio has been used in education ever since its availability”. Pennycuick (1993) of the Centre for International Education at the University of Sussex, states more specifically that interactive radio instruction (IRI) is characterized by ‘highly coordinated’ instructional materials and delivery strategies. It includes elements of active participation on the part of the students. In spite of technological advancements, radio remains the key media to which most rural people have access. Educational radio initiatives in different developing countries were effective in providing topical programmes and reaching large numbers of learners rapidly. Further, radio broadcasting is one of the greatest educational tools, which has ever been placed at the disposal of civilized man. It is an instantaneous and universal means of communication. Broadcasting is relatively new, as far as its age is concerned. However, in a short period, it has been determined definitely that it can perform three separate major functions— (i) it can sell goods and services; (ii) it can provide entertainment; and (iii) it can make education, culture and information available. Radio can be educative in formal as well as informal situations. The medium of radio is very effective for broadcast of lectures by eminent educationists, scientists, historical statements, etc. It is a rich medium for broadcast of drama, stories, commentary, sports news, educational news and educational programmes. It is popular in both urban and rural settings. Radio programmes are generally prepared on topics which are more suitable to verbal communication. In India, AIR and other radio channels render valuable assistance to classroom instructional programmes. The limitations of radio broadcasting are the following:

i. It uses only the sense of hearing.
ii. It is one-way communication.

6.3.5 Projectors: Merits and Demerits

Projector plays an indispensable role in offices, schools and universities in today’s scenario. One cannot imagine a presentation without the use of projectors. Almost all presentation rooms have projectors installed in them.

A projector is an optical device which projects figures and pictures onto a surface/wall. This surface is usually light in colour so that the things to be projected are visible to the audience. In technical terms, a projector adopts the principle of image projection with the assistance of its inbuilt optical projection system consisting of lens and optical source.

A projectors can be classified on the basis of its display properties into three types namely:

i. Cathode Ray Tube: It uses lenses to project the images.
ii. **Liquid Crystal Display:** It makes use of liquid crystal to project images.

iii. **Digital Light Processing:** It uses small mirrors to project the images.

Let us study the merits of using projectors.

i. **Picture size is large:** Front projectors generate the biggest possible image size. One can use them to create very large screen experience of a commercial movie theatre in their home. The actual image size can go up to 300” diagonal or more, but in reality the size of any given projector’s image is limited by its light output. Nevertheless, most projectors produce beautiful images of sizes 90” to 120” diagonal, which is far larger than anything we get with flat screen TVs or rear-projection TVs.

ii. **In teaching-learning:** Projectors can be efficiently used in the teaching-learning process. With the aid of a projector, videos and photographs can be displayed which makes learning more interesting for the students. Besides, theories and laws can be taught to the students in a more attention-grabbing manner. The zoom in and zoom out feature can help in seeing the minor details in a more effective way.

iii. **Space saving:** A projector can be set on a shelf, ceiling or a bookshelf. When not being used it is hardly visible.

iv. **Easy to install:** A projector being lightweight does not need much manpower and can be installed and operated by one person only.

Let us study the demerits of using projectors.

i. It requires maintenance on regular basis.

ii. A dark room is needed to use a projector.

iii. Most of the projectors need a separate audio – system.

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### Check Your Progress

3. What is the main function of a tape recorder?

4. List the main functions of a radio.

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### 6.4 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. The hardware approach to educational technology is the use of materials and equipment in the domain of education. The hardware approach is based on the application of principles of physical sciences and engineering to education and training.
2. The software approach to educational technology initially developed in early 1969 in the area of programmed learning. It was the outcome of Skinner’s efforts on operant conditioning.

3. Recording and reproducing of sound is the main function of a tape recorder.

4. Radio can perform three separate major functions—(i) it can sell goods and services; (ii) it can provide entertainment; and (iii) it can make education, culture and information available.

6.5 SUMMARY

- Education has been benefited by technology in various ways and at various levels. From both, sociological and the economic points of view, technology has made an impact on education.

- Professor Henry Ellington (1993) opined that the key function of educational technology is to bring about improvements in the general competence and efficacy of the teaching–learning process.

- The hardware approach is the use of materials and equipment in the domain of education. Audio-visual aids, for example, charts, models, filmstrips, slides, audio cassettes and equipment like films, projectors, radio, record player, television and computers fall in the category of hardware.

- The mechanization is being introduced for preservation, transmission and advancement of human knowledge. For instance, a teacher can deal with a large group of students by his discourse on radio or television.

- The software approach or software technology of education owes its origin to behavioural sciences and their applied aspects concerned with the psychology of learning. It originated from the engineering efforts of Skinner and other popular behaviourists.

- It was in early 1969 that software approach initially developed in the area of programmed learning. It was the outcome of Skinner’s efforts on operant conditioning.

- The term ‘low technology’ stands for technology that is designed to be as simple as possible. Its advantages include easy deployment, inexpensive and practical. The term ‘high technology’ refers to new technology with advanced features which keeps coming up with the advancement in science and technology.

- CCTV stands for closed circuit television. It is the most commonly used security system. A CCTV system is made up of single or multiple cameras, recording device and a monitor. The system can be wired or wireless.
• An audio tape recorder, tape deck, reel-to-reel tape deck, cassette deck or tape machine is an audio storage device that records and plays back sounds, including articulated voices.

• The invention of tape recorder has brought about a revolution in the teaching–learning process. Its main function is recording and reproducing of sound. Microphone, amplifier and reproducer are its three parts.

• Radio basically transmits signals through free space enabled by modulation of electromagnetic waves having frequencies lower than visible light.

• Radio can be educative in formal as well as informal situations. The medium of radio is very effective for broadcast of lectures by eminent educationists, scientists, historical statements, etc. It is a rich medium for broadcast of drama, stories, commentary, sports news, educational news and educational programmes.

• Projector plays an indispensable role in offices, schools and universities in today’s scenario. One cannot imagine a presentation without the use of projectors. Almost all presentation rooms have projectors installed in them.

6.6 KEY WORDS

• **Tape recorder**: It is a machine with built-in speakers and audio power amplification to drive them.

• **Projector**: It is an optical device which projects figures and pictures onto a surface/wall.

• **Microphone**: It is a device that captures audio by converting sound waves into an electrical signal.

6.7 SELF ASSESSMENT QUESTIONS AND EXERCISES

**Short Answer Questions**

1. List the characteristics of hardware.
2. What is the significance of hardware and software approaches in education?
3. What do you understand by the term “high and low technology”?
4. Mention the limitations of using radio.
5. Name the types of projectors.
Long Answer Questions

1. Discuss the merits and demerits of using CCTV.
2. Examine the educational utility of a tape recorder.
3. Explain the merits and demerits of using projectors.

6.8 FURTHER READINGS


UNIT 7 INNOVATION IN LEARNING

7.0 INTRODUCTION

Education needs innovation to keep it fresh and relevant. It is not just the teachers and educators who form it, but also the students who shape it. Social learning connects a diverse audience of motivated learners by providing an environment for collaboration, brainstorming and self- and group-learning. India is among the few countries in the developing world that are successfully experimenting with innovative teaching techniques in their bid to spread learning across the nation.

7.1 OBJECTIVES

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

- Discuss the educational utility of motion pictures
- Explain the advantages and disadvantages of films and television from an education perspective
- Elaborate the types and characteristics of microcomputers
- Analyse the significance of e-learning

7.2 MOTION PICTURES

A motion picture (sometimes called a movie or film) is a series of still pictures (frames) usually 8 mm or 16 mm in size, taken in rapid succession. When projected by a motion picture projector, they give an illusion of motion (Gerlach and Ely,
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Film vary in length from one minute or less, to 50 minutes or more. If a 6-
mm motion picture runs for more than 50 minutes in length, it is usually stored on
two or more reels. The speed at which a film is projected varies with the format of
the film. A sound 16-mm film is projected at 24 frames per second (fps) and super
8-mm films, at 18 fps. Therefore, it is possible to show films in such a manner as
to create three types of images:

(i) Normal motion
(ii) Fast motion
(iii) Slow motion

Motion pictures are very useful in teaching various subjects like literature,
drama, history, geography and science subjects. Motion pictures motivate students
as they enjoy the medium. They bring people, country, events and other aspects
on the screen. However, they are expensive and subject to damage, if used
extensively.

Hoban and Ormer have revealed the following educational advantages of
motion pictures:

- Good films can be used as sole means of imparting certain factual
  information and developing performance skills.
- Pupils will change or develop attitude and opinions, as a result of viewing
  films.
- Pupils will learn more from films if they are properly prepared and
  motivated.
- Learning will increase with repeated screenings of a film. Short single-
  concept films have certain advantages.
- Pupils can develop the will of problem-solving by viewing well-produced
  films.
- The ability to learn from films will increase with practice.

Amidst these advantages, it should not be assumed that learning would
occur only by watching films. The method of presentation may be inadequate or
the film may not be suitable for students of a particular age. Therefore, sufficient
care should be taken while selecting a film. It should be borne in mind that films
with built-in viewer participation and repetition of key points increase learning. If
these factors are lacking in a film, then these should be supplied by the teacher
during or immediately after screening of the film.

7.3 FILMS

Why do we need films? Films are universal and create connections across time,
place and cultures. Films help us understand and connect to our fast-changing
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Impactful films such as a biography, autobiography or a figment of imagination has the power to bring us closer to something much greater than ourselves. Films when used in education can bring the world to students in very real ways. They tell universal stories across national boundaries and languages. Film helps expand our horizon by introducing us to unique values, struggles, innovations and beliefs beyond our daily experience.

Types of Films are the following:
- Drama Video
- Documentaries
- TV News
- Discussions/ Interviews
- Talk Shows/ Game Shows

Let us study the advantages of films.

i. Help in building social and emotional awareness: In order to attract and hold the attention of students, teachers need to establish an emotional connection. Films are multi-sensory. A film has the potential to create an emotional connection with its subject matter and can provide a human experience. The impact of audio and visual components supports students retention of information. When enhanced with written reflection, films help students develop social and emotional learning in ways not available from textbooks or lectures. Students can experience the world through real-life people as well as see and feel what it is like for a person living around the world.

ii. Awareness about current events: Students are exposed to real-life challenges in their daily life. Some of these issues include poverty, drug abuse, violence, consumerism, unemployment, corruption, modernization, environmental changes and so forth. A short documentary film can expose students to any number of global issues, reduce isolation, and make them aware what is happening not only in their state or country but the world over.

iii. Help in integrating reflective writing assignments: Film can increase the literacy of students with connections to a source, to self and to the world. Just as students use quotes from a book or text to prove a critical thought, students can use film as a source to justify their reasoning. After viewing and discussing a film, it can help in integrating information from various points of view and apply newly learned ideas.

iv. Teaching vocabulary: Films can help to learn vocabulary around a certain theme. It is possible to teach vocabulary and even ready scripts of a certain social situation with the help of television. With sufficient
repetition and practicing even a learner at the beginning stage, may be able to acquire good number of words in his vocabulary despite his or her previous linguistic experience.

7.4 TELEVISION

Education television excels as a medium of large-scale delivery of information. In the modern times, television is an integral part of the culture. TV provides entertainment, news, education, culture, weather, sports, etc. Television is the most powerful medium of mass communication that has ever existed and it has revolutionized our life in many ways. It appears that the future television is going to have definite positive contribution to make children’s life in the classroom happy (M.J. Apter). Television is already widely being used in schools. It is a powerful medium of communication that calls for the use of auditory as well as visual sense of learners in receiving education.

Television offers many benefits to children and learners in general, including the following:

- It enables the sharing of cultural experiences and thus brings the world closer.
- In Indian setting, specifically where togetherness is valued, shared viewing of programmes gives the family members of all ages, an opportunity to spend time together.
- Television can be used by parents as a catalyst to get children into the habit of reading. This can be done by following up televised programmes through books on same subjects.
- Exhibiting social responsibility, television can spread cultural and family values in an implicit manner.
- Television programmes provides an opportunity to parents to explore and discuss controversial or sensitive issues with children.
- Learning skills and even socialization of young children can be developed through balanced and efficient use of educational programmes.
- Young people can become more aware of other cultures and people through news, current events and historical programming.
- Documentaries can give rise to judgmental thoughts concerning society and the world.
- The world of art and music can be opened for people by cultural programming on television.
• Televised instructions have the potential of improving the process and products of learning as they involve thorough planning, systematic presentation and integration of a wide range of audio-visual material and appliances.

Television is an important aid to teachers, supervisors and educational planners. It has been utilized for informal and formal education and for distance and correspondence education. There are some limitations associated with television in the form of one-way communication, impersonal nature, passive learning, no interaction, and expensive media.

India, like other developing countries, has been using television for enriching and improving the quality of education at every level. It has been particularly used for expanding educational facilities, particularly in rural and backward areas, for normal and informal systems. New dimensions have been added to the use of television for instructional purposes with the advent of satellites. So far there has been use of open circuit television in India. Closed circuit use of television for educational purposes has not been explored much. Closed circuit television broadcasting is a sort of micro level local arrangement limited to a single school, or several schools located in a particular region. The schools are connected by a cable or microwave system. The telecast cannot be received outside the selected network and signal is not required to meet the commercial broadcasting regulations.

Check Your Progress
1. List any two educational advantages of using motion pictures.
2. Name the types of films.
3. What are the limitations of using television as a medium for imparting education to students?

7.5 MICRO COMPUTERS: TYPES AND CHARACTERISTICS

A microcomputer is a complete computer on a small scale, intended for use by one person at a time. An obsolete term, a microcomputer is now primarily called a Personal Computer (PC), or a device based on a single-chip microprocessor. Smaller than a mainframe or minicomputer, a microcomputer uses a single integrated semiconductor chip for its Central Processing Unit (CPU). They also contain memory in the form of Read-Only Memory (ROM) and Random Access Memory (RAM), Input/output (I/O) ports, and a bus or system of interconnecting wires; all housed in a single unit usually referred to as a motherboard.
Common microcomputers include laptops and desktops. Beyond standard PCs, microcomputers also include some calculators, mobile phones, notebooks, workstations and embedded systems. Some of them are discussed below:

**Types of Micro Computers**

There are five different types of microcomputers. These are the following:

i. **Notebook computer**: These can be as small as a physical notebook. They can be great for travellers as they are highly portable and easy to use.

ii. **Laptop**: They are bigger in size and heavier than a notebook, however; still portable.

iii. **Desktop computer**: These, as the name suggests, are designed to fit on a desk or flat surface such as a table. Once again, they are heavier and bigger than a laptop but are often designed to complete more complex operations as well as having each component such as the mouse, keyboard and screen separate from the main unit and simply attached by wires.

iv. **Mini tower**: This is a version of the desktop computer but as suggested by the name; it has a smaller main unit or tower. This not only means it takes up less space on a surface or desk but is designed to stand upright on any surface, whereas a desktop computer tower is designed to lay flat with the screen often on top.

v. **Full tower**: These are very similar to the mini tower with the main difference being that the tower is slightly higher and wider than the mini. Other than this, the differences are very slight.

Most of these microcomputers are very powerful due to the microprocessor chip that is installed in each one. Each has a different purpose and function, and the chip set reflects the intended use. Microcomputers is not the only class of computers. There are also supercomputers, minicomputers and mainframes.

**7.5.1 Advantages and Disadvantages**

Let us go through the merits of using microcomputers.

i. **Small size**: PCs are smaller in size as compared to mainframe and supercomputers.

ii. **For making apps**: PC is used for making different mobile apps. Nowadays every smartphone needs apps for better use. Every app in various app stores helps mobile users in fulfilling their needs.

iii. **Stock exchange**: In the old days, stock exchange business was mostly done by phone calls. But nowadays, every investor has the software installed on his PC by which he can buy/sell stocks in the stock market.

iv. **Maintenance is easy**: Most of the PC users know how to fix the problem in the PC. For example, if something wrong happens in the PC then one
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can simply reinstall the operating system. Replacing hardware parts of the PC is also easy.

v. Used in teaching: Microcomputers (laptops) are being widely used by the teacher in classroom teaching. Teachers are increasingly adopting the use of new technology such as PowerPoint Presentation and others tools to enhance the teaching-learning process.

vi. Used in businesses: In today life, every type of business uses PC for handling their office work. All the data of the business is now stored in the PC and in remote servers.

vii. Accounting: Accounting software is run on the PC which makes financial reports of the company or any individual. In shops, accounting software is also used for day-to-day calculation of the products.

viii. Research and information: Students, research scholars, market analysts and so forth use PCs for their research work. People get information from the Internet and then save the information on different softwares.

ix. Connect with people: The world is known as a global village. We can connect with any person across the world and communicate with any person via voice/video/text chat and emails. People can share their views on any topic online.

x. Portability: These computers are easily portable because of their small size. In 1970 and 1980 computers were big and covered the entire room. Because of their huge size they were not easy to move from one place to another. But today, the scenario has changed and PCs (laptops, notebooks) can be easily carried from one place to another.

xi. Low cost: PCs were earlier expensive but now PCs are cheaper and everyone can buy it easily. There are many types of desktop computers depending upon the processor type (i3, i5, i7). For common use, one can buy cheaper PC that can do common works like Internet browsing and watching movies, playing games and so forth. If ones want to use big software then higher capacity computers can be used.

xii. Multiple uses: One desktop computer can be used for multiple purposes; for example, printing, scanning, browsing the Internet, booking tickets online, watching movies, logging of different users, playing games, storing data, accounting, making games, apps and desktop software and so forth.

xiii. Accurate results: Human can make error in the calculation but computer is a very intelligent machine and it will give accurate result every time.

Let us go through the disadvantages of using microcomputers.

i. Least powerful: Microcomputers have least computational power as compared to mainframe and supercomputers.
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ii. **Computer addiction:** Children and middle age users get addicted to games and Internet uses. These activities affect their day-to-day routine and overuse may result in health problems.

iii. **Less storage:** Desktops have less storage and for storing large data extra storage devices are needed.

iv. **Weak in performance:** Many PCs have low processors that affect the performance of the computer; for example, playing games and running big software is difficult on such PCs.

v. **Negative physical effects:** If PC is used for a long time then physical health may be affected like eye strain, neck pain and back problem.

vi. **Difficult to upgrade:** As desktop PCs have different motherboards for every type of processor so it is difficult to upgrade PCs for high performance.

vii. **Lack of security:** Hackers can hack a computer if it is connected to the Internet and sensitive data can be stolen or loss may happen due to virus.

viii. **Public safety:** Children can have access to adult content and people can view sensitive content that is not allowed by the government.

7.6 **E-LEARNING: INTERNET WEB BASED LEARNING**

E-learning is an approach to facilitate and enhance learning through, and based on, both computer and communication technology. It refers to the use of computer-based electronic technologies of Internet, e-mail, websites and CD-ROMS to deliver, facilitate and enhance both formal and informal learning and knowledge sharing from any place at any time. The communication devices can also include digital television, personal digital assistants (PDAs) and mobile phones.

E-learning is also called Computer-Based Training (CBT). Generally, CBT and e-learning are treated as synonyms, but CBT is the older term dating from the 1980s. The term ‘e-learning’ evolved from CBT along with the maturation of the Internet, CDs and DVDs. It includes Internet-based Learning, Web-based Learning and Online Learning.

E-learning is significant in the following ways:

- It enables flexible learning where just-in-time learning is possible. It is a means to effective and efficient learning due to its ease of access and the pace being determined by the learner.
- It facilitates collaborative internet and web-based learning opportunities to the learners.
- It supports distance learning with wide area networks (WAN). It addresses the practical side of learning by organizing the topics to be taught and creating multimedia CD-ROMs or websites. An important
Advantage is that hyperlinking is possible and having interactive parts illustrating difficult things or for doing exercises is also possible. It allows a wider range of learning experiences, such as, educational animation to online learners.

- It imparts e-training through the asynchronous and synchronous communication modes, permitting the learners the convenience of flexibility. Asynchronous learning uses technology such as blogs, wikis and discussion boards to allow participants to contribute when time allows. Synchronous activities allow all participants to join in at once with a chat session or a virtual classroom or meeting.

- It develops the role competencies of the personnel in an organization through the use of electronic media. Specialized training is rendered through customized software, which addresses the particular needs of the clientele mostly through the synchronous mode on dedicated broadband internet connectivity. Equally, it also renders training to the learners through the generic software displaying universal contents in asynchronous mode to the learners through a shared network with limited Internet access or on World Wide Web.

- It enhances teaching by professional development of teachers through training on usage of ICT in education. E-learning system like World Links enables the teachers to integrate technology into teaching and thus create dynamic student-centred learning environment in classrooms. The faculties can also interact with their peer groups in the world and exchange ideas and notes on the subject. Hence, as put by Gupta and Singhal, e-learning is a planned effort towards providing interactive and experiential learning; flexibility in terms of time, place and pace; participation and accessibility; expertise and qualitative subject matter; best resource at the learners’ doorsteps and personalized training; and centres round the trainees.

There are some limitations in e-learning such as lack of knowledge and skills for the use of multimedia among learners may prove futile in taking advantages from the valuable service of e-learning. Lack of accessibility to the needed resources, tools and equipment like computers internet and web services for students might not be affordable in terms of cost is also another problem. Lack of provision of pre-service training for getting acquainted with the skills of using e-learning is also a problem. There is no proper provision of training programmes for teachers and students for getting acquainted with the skills required on their part for the use of e-learning. As a result, the teachers neither have any inclination towards e-learning nor have any competence to use it. The rapid evolution in technology and knowledge based competitive society, the students, teachers and other staff of distance education system requires the support and services for the existing system of education and instruction through properly organized and guided system of e-learning and e-courses.

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Check Your Progress

4. Name the types of microcomputers.
5. How is e-learning significant in the contemporary scenario?

7.7 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. Two educational advantages of using motion pictures are the following:
   i. Good films can be used as sole means of imparting certain factual information and developing performance skills.
   ii. Pupils will change or develop attitude and opinions, as a result of viewing films.

2. The types of films are the following:
   - Drama Video
   - Documentaries
   - TV News
   - Discussions/Interviews
   - Talk Shows/Game Shows

3. There are some limitations associated with television in the form of one-way communication, impersonal nature, passive learning, no interaction, and expensive media.

4. The types of microcomputers are the following:
   i. Notebook computer
   ii. Laptop
   iii. Desktop computer
   iv. Mini tower
   v. Full tower

5. E-learning has evolved drastically in today’s scenario with the advancements in science and technology. E-learning is significant in the following ways:
   - It enables flexible learning where just-in-time learning is possible. It is a means to effective and efficient learning due to its ease of access and the pace being determined by the learner.
   - It facilitates collaborative internet and web-based learning opportunities to the learners.
7.8 SUMMARY

- A motion picture (sometimes called a movie or film) is a series of still pictures (frames) usually 8 mm or 16 mm in size, taken in rapid succession.
- Motion pictures are very useful in teaching various subjects like literature, drama, history, geography and science subjects. Motion pictures motivate students as they enjoy the medium.
- Films when used in education can bring the world to students in very real ways. They tell universal stories across national boundaries and languages. Film helps expand our horizon by introducing us to unique values, struggles, innovations and beliefs beyond our daily experience.
- Education television excels as a medium of large-scale delivery of information. In the modern times, television is an integral part of the culture. TV provides entertainment, news, education, culture, weather, sports, etc.
- Television is an important aid to teachers, supervisors and educational planners. It has been utilized for informal and formal education and for distance and correspondence education.
- Common microcomputers include laptops and desktops. Beyond standard PCs, microcomputers also include some calculators, mobile phones, notebooks, workstations and embedded systems.
- E-learning is an approach to facilitate and enhance learning through, and based on, both computer and communication technology.
- There are some limitations in e-learning such as lack of knowledge and skills for the use of multimedia among learners may prove futile in taking advantages from the valuable service of e-learning.

7.9 KEY WORDS

- Motion picture: It is a series of still pictures (frames) usually 8 mm or 16 mm in size, taken in rapid succession.
- E-learning: It is an approach to facilitate and enhance learning through, and based on, both computer and communication technology.
- Documentary: It can be a film, television programme or radio programme which provides factual information about events or persons.
7.10 SELF ASSESSMENT QUESTIONS AND EXERCISES

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Short Answer Questions
1. State the utility of motion pictures from an educational perspective.
2. Briefly mention the advantages of films in the teaching-learning process.
3. List the benefits television offers to children and learners.
4. What are the advantages of using microcomputers?

Long Answer Questions
1. ‘Education television excels as a medium of large-scale delivery of information.’ Justify the statement.
2. Discuss the types and characteristics of microcomputers.
3. Give examples to highlight the use of e-learning.

7.11 FURTHER READINGS

UNIT 8  DISTANCE EDUCATION

Structure
8.0  Introduction
8.1  Objectives
8.2  Concept and Objectives of Distance Education
8.3  Strategies
8.4  Counseling Methods
8.5  Different Contemporary System
   8.5.1  Correspondence Education
   8.5.2  Open Education
   8.5.3  Distance Education
8.6  Answers to Check Your Progress Questions
8.7  Summary
8.8  Key Words
8.9  Self Assessment Questions and Exercises
8.10  Further Readings

8.0  INTRODUCTION

In a democratic country such as India everyone has the right to enjoy equal rights and equal opportunities, constitutionally guaranteed for all. The implementing of the rights under the social sectors such as right to education, right to employment, right to equal pay for equal work, right to health services, right to participate in the political life of one’s choice, right of access to health services, etc., has been launched for bringing the necessary upward mobility of different sections of people in India. Besides, today’s society is regarded as a knowledge-based society. This knowledge-based society has the demand for human capital. Education is the basic way that can supply the skilled manpower for generating development in a nation. Education develops the human being in the true sense of the term, developing all potentialities as well as capabilities through which a nation can benefit in its development. Thus, we need such an institution or a mode of education through which education can be made accessible to all without any discrimination.

Education is the only way to boost up the positive social transformation for the welfare of the country. Education can make people economically empowered and educationally competent; and make them self-reliant, self-dependent and in the control of their own decisions and choices. Life Skills Education is a practical way for developing the competencies of the people, and thus finally it can make them empowered in their day-to-day life. Therefore, for disseminating information or knowledge in order to develop capacity building among the people, there is a need to explore the various modes of education.
Although demographically India has great potential, the growth of manpower and the level of its engagement in productive activities are yet to be fully harnessed. The literacy rate in India is rather low compared to that of the developed countries. Even within India, there are considerable differences among the states and regions in terms of employment, gender differences in all stages of education, regional disparities in Gross Enrolment Ratio and literacy level and so on. Besides, India needs to achieve the target of inclusive growth, progress towards millennium development goals and also needs to target towards the formation of human capital; and education is the only way to achieve these goals. This is because educated people are usually better productive workers; for they can use the capital more effectively, adopt new technologies and learn from their mistakes.

Therefore, it is an urgent need to disseminate information and knowledge to the people through various modes of education. Open and distance learning (ODL) is the most viable option for making education as accessible as possible for all. It has emerged as an effective means to bring education to the doorstep of those who are deprived of the educational opportunities in the conventional mode in the mainstream educational institutions. This system offers opportunities to millions of underprivileged learners including those like the self-employed and the housewives who desire for an enlightened and productive way of life. Under these circumstances, it has become necessary to discuss the various aspects of the ODL system in an effort to remedy its shortcomings, if any, and to highlight its strength.

In this unit, the concept, objectives and strategies of distance education have been discussed. The main forms of counselling methods and their importance have been analysed. The unit will also provide an in-depth knowledge about different contemporary systems of education.

8.1 OBJECTIVES

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

- Discuss the meaning and objectives of distance education
- Analyse the strategies of distance education
- Explain the main types of counselling methods
- Interpret the advantages and disadvantages of correspondence education
- Discuss the characteristics of open education
- Analyse the need and importance of distance education

8.2 CONCEPT AND OBJECTIVES OF DISTANCE EDUCATION

Distance education is an alternative way of learning; providing education at a large scale besides having the conventional system of learning. It means a mode of
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Learning through which education can be accessed by the people irrespective of geographical barriers, physical existence of teachers, space, time and age. In a knowledge-based society, open and distance learning is the most demanding medium of education for the people. The Eleventh Five Year Plan of the Government of India made a target to cover around 40 per cent the total number of students under open and distance learning system. Today, for its flexibility, this system is considered indispensable as far as education is concerned with attaining the 3A’s, i.e., getting education at anytime, anywhere and anyhow. The basic objective behind this system is to make democratization of education possible in India. Better access, lower costs, greater flexibility, high quality are some of the objectives of open and distance learning.

In the words of professor Perraton (1981), distance education is ‘an educational process in which a significant proportion of the teaching is conducted by someone removed in space or time from the learner.’ According to professor, Ochoa (1981), ‘distance education is a system based on the selective use of instructional media both traditional and innovative that promotes the self-teaching learning process to achieve educational objectives, with a potentially greater geographic coverage than the traditional face-to-face system of education.’

Thus, from the mentioned definition it is clear that distance education means:

- Separation of teachers and learners
- Institutional accreditation
- Use of mixed-media courseware
- Two-way communication
- Possibility of face-to-face meetings
- Use of industrialized processes

The open and distance learning (ODL) system is the only corridor through which those sections of population who were once deprived from the purview of higher education in conventional system for one reason or other, can pursue lifelong learning in a flexible and cost-effective mode. These sections of population include, inter alia:

- Those who dropped out from schools and colleges on economic compulsions and are now engaging themselves in trade and business.
- Those women who got married early and discontinued their education in schools and colleges.
- Those who work in offices and industries who need to gain new/additional degrees and diplomas required for their professions.
- Those persons including housewives who simply could not carry on their studies in the conventional system in time and now they are desirous to pursue education.
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Check Your Progress
1. What is the main objective of distance learning?
2. How has Perraton defined distance education?

8.3 STRATEGIES

In developed countries and developing countries, distance education plays an important role in bridging enforced distances. Distance Education (DE) comprises of all the teaching learning arrangements in which the learner and the teacher are separated by space and time. In distance education, learners are not physically present in a traditional setting of a classroom. Transaction of the curriculum is effected by means of specially prepared materials (self-study-learning materials) which are delivered to the learners at their doorstep through various forms of media such as print, television, radio, satellite, and audio/video tapes, CD-ROMs, the Internet and World Wide Web.

A technological medium replaces the inter-personal communication of conventional classroom-based education that takes place between the teacher and the learners. Communication between the institution, teacher and learners is mainly through electronic media (telephone, interactive radio counselling, teleconferencing, videoconferencing, chat sessions, email and website) and also through postal correspondence and limited face to face contact sessions held at study centers that are set up by the DE institutions as close to the learners’ homes as possible.

The major objectives of the distance education (DE) system are as follows:
- To democratize education to large segments of the population, in particular the disadvantaged groups such as those living in remote and rural areas, working people and women.
- To provide an opportunity for up-gradation of skills and qualifications.
- To develop education as a lifelong activity to enable persons to update their knowledge or acquire knowledge in new areas.

India has one of the largest DE systems in the world, second only to China. Some of the institutions which offer distance education are as follows:
- National Open University
- State Open Universities
Distance Education Institutions (DEIs) at-Institutions of National Importance-Central Universities-State Universities-Deemed to be Universities-State Private Universities

- DEIs at Stand-alone Institutions-Professional Associations-Government Institutions-Private institutions

**Historical Developments**

Five decades ago, policymakers realized the imperative need of DE in order to expand the base of higher education. With the expanding base at the elementary and secondary education levels, the demand for higher education had increased. The University Grants Commission (UGC) suggested in its report for 1956-1960 that proposals for evening colleges, correspondence courses and award of external degrees should be considered. The Planning Commission took serious note of such a need and in its Third Five Year Plan mentioned the need for the introduction of correspondence education in the country. In the light of the observations made by the Planning Commission the Central Advisory Board on Education recommended the setting up of an Expert Committee under the chairmanship of Dr. D.S. Kothari, the then Chairman of UGC, to look into the proposal of introducing correspondence courses. The Expert Committee recommended the institution of correspondence courses in view of the greater flexibility, economic viability and innovative methods of imparting education. The committee also suggested that correspondence courses in India should be administered by the universities only and in the first instance, by one University, viz., the University of Delhi as a pilot project. The following points will help one to analyse the development of distance education system:

- In 1962 the University of Delhi’s School of Correspondence Courses and Continuing Education was established. Subsequently the Education Commission (1964-66), under the chairmanship of Dr. D.S. Kothari, also perceived correspondence education as an answer to the increasing pressure of numbers as well as the growing financial pressures on the universities.

- The next decade i.e. the 1970s saw the growth and spread of the Correspondence Education system in India, by more conventional universities opening Correspondence Course Institutes (subsequently renamed as Directorates of Distance Education/ Centres of Distance Education).

- The opportunity of access, affordability and convenience offered by the DE system contributed to its increasing popularity and growth. But again, the DE system was plagued by the rigidities of the conventional system. The only flexibility was with regard to the larger number of seats. Education was still out of the reach of the marginalized and the disadvantaged. It was realized that unless we open educational opportunities to the deprived, unless we remove the structural rigidities in our educational system and unless we
integrate the educational system with developments in communication technology, we cannot and will not make headway in realizing the uphill task of educating majority of the people and of catering to the diverse types of education that a modern society demands.

- Against this background, the government introduced the Open University (OU) system in the 1980s, with the objective to further democratize opportunities for higher education to large segment of the Indian population, particularly those for whom access was difficult or impossible such as those living in remote and rural areas, working people, women and other adults who wish to acquire and upgrade their knowledge and skills through studies in various fields.

- The Ministry of Human Resource Development in its National Policy on Education (NPE) 1986, gave prominence to an OU system as a means to ‘augment opportunities for higher education and as an instrument of democratizing education’. Clearly, the vision was that OUs would be different from conventional universities.

- A new chapter in DE system began with the establishment of Dr BR Ambedkar Open University, Hyderabad in 1982, followed by the establishment of Indira Gandhi National Open University at the national level by the Parliament of India in 1985. The idea was accepted by many states and 1987 saw the emergence of two more Open Universities, namely, Nalanda Open University (NOU) Patna, Bihar and Vardhman Mahaveer Open University (VMOU), Kota, Rajasthan. Subsequently, Yashwantrao Chavan Maharashtra Open University (YCMOU), Nashik, Maharashtra was established in 1989.

- The major responsibility for the promotion and coordination of Open Universities and DE was bestowed by the Parliament on the Indira Gandhi National Open University (IGNOU), instead of the UGC, the statutory authority for regulating higher education India. Thus, IGNOU became a unique institution as it was entrusted with a dual role: of functioning like an Open University by offering programmes of education and training through distance mode and also acting as the promoter, coordinator of the Open and Distance Education system in the country and determining standards in such systems. To fulfill this particular mandate the Distance Education Council (DEC) was set up by IGNOU in 1991 as a statutory mechanism under IGNOU Act which became operational in February 1992. The DEC functioned within the broad framework, and the policies laid down by the Board of Management of IGNOU while enjoying a significant measure of autonomy in its operations.

- As per the mandate of the DEC and the NPE 1986, which was revised in 1992, the DEC started interacting with the State Governments for establishing the SOUs in the respective states. As a result of DEC initiatives several
State governments established Open Universities. As emphasized in the NPE of 1986 and subsequently Programme of Action in 1992, the OUs adopted a radically different approach to reach the disadvantaged by adopting a variety of media and delivery channels for dissemination of information and knowledge. As a result of this they have been able to make a definite impact on society, and more Indians have access to higher education than ever before.

- The Distance Education Council (DEC) took several initiatives for promotion, coordination and maintenance of standards of open and distance education system in the country. DEC has developed guidelines for regulating the establishment and operation of ODL institutions in the country.

- In August 2010, the Ministry of Human Resource Development constituted a Committee under the Chairmanship of Professor Madhava Menon in respect of regulation of standards of education imparted through distance mode.

- In view of the acceptance of the Report submitted by the Madhava Menon Committee by the Ministry of Human Resource Development (MHRD) and its recommendations for the creation of a new regulatory body for ODL system, the Distance Education Council of India (DECI). The Madhava Menon Committee also decided that as an interim measure, the DEC of IGNOU may be shifted to UGC.

- Subsequently, the MHRD issued an order, dated 29th December 2012, transferred the regulatory authority of distance education from IGNOU to UGC. Thereafter, IGNOU notified the repeal and deletion of Statute 28 of IGNOU Act and dissolution of DEC on 1st May 2013. UGC issued an order taking over the physical infrastructure of erstwhile DEC on ‘as is where basis’ is and the staff working at erstwhile DEC on ‘deemed deputation basis’.

In the existing terms, two terms that are being used almost inter-changeably are ‘Open Learning’ and ‘Distance Education’ and they are often combined to be known as Open and Distance Learning (ODL). Open learning is a philosophy and Distance Education is the mode used for translating it into reality as the two are complementary to each other.

Open learning, which covers a wide range of innovations and reforms in the educational sector that advocates flexibility to the learner with regard to entry and exit, pace and place of study; method of study and also the choice and combination of courses; assessment and course completion. The Open learning system aims to redress social or educational inequality and to offer opportunities not provided by conventional colleges or universities. Educational opportunities are planned deliberately so that access to education is available to larger sections of the society. Thus, ODL is a term which accepts the philosophy of ‘openness’ and uses the ‘distance mode’ of learning.
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Conclusion

Education is developed within the context of a real world with real problems and challenges. It offers people the tools for overcoming problems and rising to greater heights in terms of values, concepts, knowledge, and skills. These tools cover three major areas: the area of natural sciences, which allows human beings to be in contact with their environment; the area of social sciences, which allows human beings to create their socio-economics milieu for interaction and interrelationship; and the area of communication, which allows human beings to build up better understanding amongst them. Education is concerned with the development of this intricate intellectual, technological, and social complex. Given that, education interacts on all aspects of the life of the nation, of the family, and of the individual. It has tremendous potential to bring about a change for the better.

Distance education methodologies can break the boundaries of time and place and offer a flexibility that enables people in different circumstances to enjoy the advantages of education. Moreover, the possibility of providing education to all at reasonably low cost opens the way further for mass education in third world countries, which are likely to be hamstrung by tight financial constraints for some time to come. Yet unless third world countries develop their vast human resource potential through education, they will continue to suffer from the underdevelopment and dependency that characterize today’s unbalanced and unjust situation. Thus, education can become a tool of liberation for third world countries—liberation from the cycle of poverty and deprivation that is the symptom of a people unable to control their destinies scientifically, politically, and economically. Without the knowledge that brings about liberation, third world countries will continue to be buffeted by the vagaries of an international order that they do not control. They will continue to be the victims of circumstance, prey to the traditional fundamentalism of the past and possibly to the totalitarianism of the future. Therefore, Education and more specifically distance education, offers a brighter prospect.

Check Your Progress

3. What is the aim of open learning system?
4. How is transaction of curriculum effected in distance education?

8.4 COUNSELING METHODS

Distance education has many sub-systems. Counselling is one of the sub-systems of the overall system of distance education. In a systematic approach to course design, the needs and objectives are equally important as the available resources. Hence, once it is decided what is necessary or desirable, consideration of what should be actually done and how to be done with the media and staff available is
important. The type of feedback and advice to be provided to the learners is
decided thereafter.

However, in the case of distance education, the distance between counsellor
and learner is the underlying difficulty. To combat with this problem, many institutions
have taken on the idea of establishing local study centres as a site for contact with
the learners. Let us look into the role of study centres and the regional centres
established by most of the institutions with large number of learners for providing
a bridge between the central institution and the local study centres. The role of the
institution in providing learner support has undergone remarkable changes as a
result of the change in the needs of learners, curricular changes, advent of multimedia
systems and various motives of the learners which has also resulted in a move
towards learner-centred learning. This has led to the re-defining of the very concept
of support services and has taken them from a marginal to an integral role in the
instructional package actively promoting the intellectual development of the distance
learner through continuous interaction and learner’s active participation in the
learning process.

**Study Centres**

There is considerable variation in the nature and functions of a study centre from
country to country and institution to institution. Now we will study about the general
characteristics of study centres.

A study centre is a part of an overall system of support for learners. It
includes basic learner support along with teaching-learning materials. Course units
should contain written advice on study skills, help the learners with difficulties and
give them feedback on activities and exercises in the form of printed answers.
Tutors provide advice and comments when they evaluate assignments for the
correspondence course. Sometimes learners also get help from tutors or counsellors
over the telephone or by face-to-face interactions at residential courses. However,
the main source of regular face-to-face support is usually available at the study
centre. A study centre is a place which is regularly open to learners who wish to
attend learning sessions. Learners may come for seminars or private study, or to
meet with a tutor, counsellor, or peer learner individually. Usually the study centres
are borrowed rooms in buildings housing conventional educational institutions,
where the staff works part-time; so, the timings for the learners attending the study
centre are restricted. Therefore, these study centres are usually open only outside
normal working hours, that is, in the evenings or at weekends. In countries where
the majority of distance learners are working adults, the limitations of access resulting
from these constraints are of little importance when the learners are free to attend
the sessions during these hours. In some countries, study centres are open during
working hours only.

Many study centres are in schools. A classroom is opened for the use of
distance learners in the evenings or at weekends. The room is already furnished
with blackboard, chairs and desks. Sometimes the adult learners find that they are expected to use miniature chairs designed for small children. In fact, rooms in colleges or conventional universities are often more suitably equipped for adult learners and are also used for study centres. However, some small towns have institutions of higher education and schools or other premises as community centres for their use. It would be expensive to pay rent for a permanent infrastructure or even build a study centre. Fortunately, schools and colleges are normally empty in the evenings or at weekends. This makes establishing study centres cheaper, economical and easier. Analysis of a cross-section of prospective learners in a region and estimate of the proportion of learners who can attend the study centre need to be made prior to establishing a study centre. The institution will look for a way to enable as many learners as possible to attend. One needs to know the maximum number of times the learners are expected to travel to reach the centre, the mode of travel available and the cost entailed. The expenses thereby entailed by the institution, the distance that may be traversed, and the frequency of such classes should also be considered. Taking account of such a long list of factors makes it evident that the location of study centres is problematic. It is not easy to provide most learners with easy access to a study centre. Moreover, it is always impossible to set up study centres that are easily accessible for all learners. For those learners who cannot attend or who can attend very infrequently, it is necessary to think of alternatives, such as telephone contact or audiotapes through the post, or even letters or any other such mode.

Besides the basic furniture to serve its learners, there is generally a need of some equipment and facilities in the study centre. These equipments and facilities are discussed in the following section.

**Adequate Equipment**

Head teachers and college principals may be reluctant to allow distance learners and their tutors to use the institution’s video recorder or laboratory equipment, even though they may be happy to allocate a room to learners, while study centres in non-educational institutions may not have such facilities anyway. The following equipment may be needed in the study centre (how much will actually be needed depend on what functions are allocated to a particular centre and the number of learners opting for that particular centre):

- Books (course texts, reference books, background reading books).
- Laboratory equipment and supplies for science subjects, or any other subjects with a practical component.
- Audio-visual or computing equipment (video playback or television set, radio set, audio-cassette playback, language laboratory equipment, slide projector, computer, and so on) and information leaflets (on the distance teaching institution and its facilities, on career possibilities for graduates, and so on).
Basic office equipment (typewriter, simple duplicator, photocopier).
Classroom equipment (overhead projector, blackboard, and so on).
Stationery and office supplies.
Cupboards and filing cabinets for storage.

Generally, the study centres are equipped with very few of these items. Though a full range of equipment may be desirable, we may not propose a lot of equipment for each study centre as it would be expensive to acquire them for only a few learners who may opt for that centre. So, the bare minimum equipment is to be provided and the choice will depend on the functions envisaged for a particular centre. The absolute minimum is the meeting room tables and chairs. However, it may be decided that a study centre should have some special equipment, probably a complete set of the institution’s course material, including texts, set books, audio-visual materials and playback facilities. The choice of further equipment is difficult and depends largely on the functions of the study centre. If the centre has to serve as a source centre for learners as well as a meeting place, it will need a wider range of equipment. Sometimes, learners have alternative access to equipment, at residential courses or at public libraries. Such factors can help cut down the expenditure.

It would be inequitable to equip urban centres, which attract many learners, better than rural centres which attract only a few, and distance-teaching institutions generally try to make sure that all learners have access to equal resources by providing similar facilities in all study centres. The storage of equipment may pose some problems. There needs to be a permanent and secure storage place. This may increase the cost of hiring space and may even not be available in the building used as a study centre.

If an institution decides that its study centres must have most of the items suggested above, it will probably have to bear the cost of hiring a permanent, dedicated space for its learners, rather than making use of empty rooms out of normal hours. An alternative is to store the equipment in a main centre and transport it to local centres as and when necessary. Such an arrangement has transport and cost implications and is administratively demanding and difficult like special arrangements have to be made for early access to rooms if equipment has to be set up in advance of a seminar, equipment has to be checked after use, and schedules of use have to be developed and followed. While costs of equipment may be reduced through central storage, the overall costs of using it may actually increase. Another constraint relates to how easy it is to use the equipment supplied in every locality. Audio-visual equipment and computers need electricity. Electricity from a main connection is probably available to the kinds of public building used as study centres in most cases but it may be intermittent and unreliable in rural areas. A learner who has travelled several kilometres on a weekend in order to watch a video crucial to his/her studies will not be well pleased if a power cut of several hours makes viewing on that day impossible. Further difficulties arise if equipment...
Service facilities are inevitably poorer in remote areas than in urban areas.

**Staff**

Usually a distance-teaching institution employs part-time staff in its study centres. The first need is for a coordinator with administrative and supervisory responsibilities. In order to operate effectively, the coordinator needs to live near the study centre, and often a senior member of the school or college where the centre is located takes on this role. In addition, teaching staff is needed to run seminars and to hold tutorials. As far as possible, the central distance-teaching institution will seek to find and appoint the staff members locally, drawing on local graduates and professionals, as well as school teachers and lecturers with appropriate specializations. In some subjects, particularly those of minority interest, it may not be possible to find local specialists. In such cases, the institution may have to appoint tutors who could then serve a number of study centres.

This last option increases costs of the institution and is difficult to arrange. In cases where a shortage of tutors is foreseen, an alternative is to appoint local study supervisors. These do not need to be subject specialists and could have a variety of functions: they might simply be administrators supervising the study centre during the hours when it remains open; they might lead discussions in study groups; a non-specialist can do this effectively after a brief training in adult education techniques; or they might act as conveners of learner self-help groups. As soon as a distance-teaching institution embarks on establishing study centres, it has to take on the task of supporting the local staff. They need to brief the staff about techniques of working with distance learners, and they need a thorough introduction to the objectives and content of the course they are to teach. Besides providing face-to-face orientation, the institution usually has to develop handbooks and notes for part-time staff at study centres, including written suggestions for activities in seminars and tutorials which the course team feel would be useful. In some cases, radio programmes as well as print may be used for staff support.

In higher education institutions, such as distance-teaching universities, academic staff may at times have difficulty in accepting that people without high-level qualifications are asked to teach their courses. Nevertheless, learners must be made aware that with appropriate guidance such local tutors and supervisors can contribute to the learning process significantly. A study centre also needs support staff such as laboratory technicians, clerical assistants or caretakers. Usually, such staffs are shared with the host institution.

**Functions of a Study Centre**

Activities in study centres are very different from those in a conventional classroom or lecture room. This involves teaching and counselling, providing access to resources.
Teaching

In distance education, some of the teaching method in study centres is similar to teaching in conventional education. But such teaching only covers selected topics, while learners spend most of their time in the centre engaged in other activities. Thus, teaching takes its place as only one of the functions of the centres and has its own characteristics.

1. Teaching Groups

Let us try to assess the need of teaching study centres for the learners of distance mode. Surely this is a contradiction in terms. Good distance-teaching materials can and must cover everything that learners need to know to succeed in their course. Face-to-face teaching is an extra component of the course and is an important one. It has the following main functions:

- Learners are to be equipped with the study skills required to cope with distance learning.
- Learners' problems and difficulties in understanding the subject matter are to be dealt with.
- Learners are to be made aware of practical work.
- Learners may be encouraged to learn from each other.
- Learners may be familiarized with the concept of individual teaching.

In any group of learners, whatever their age and their level of study, there will be some who are more in need of support and assistance than others. A good working principle is that learners early in their career are more likely to need more face-to-face support than those who are experienced in order to build up the skills they need for studying at a distance. For example, at the British Open University, the foundation level learners are given more access to face-to-face seminars than higher-level learners. When the same university admitted a trial group of eighteen-year-olds, the non-completion rate was higher than it was for older adults. One probable explanation could be that young learners lacked strong motivation and needed an even greater degree of support.

In distance study, contact hours in study centres are not intended to cover additional subject matter which is included in the written units and media inputs. Indeed, one task for the face-to-face tutor in distance education is to resist pressure from learners to cover everything like a class teacher. Rather time is needed to help the learners become oriented to distance education and gain the study skills they need in order to achieve self-reliance and the ability to study independently, i.e., helping them to learn on their own. Another extended function of contact is to help learners to approach assignments. A tutor may explain the kind of answer that a question requires and give some ideas for answering the questions. Distance learners cannot easily get help on such matters once they return home and may even abandon their courses if they get stuck on an easy question. Similarly, tutors
may help with pre-exam revision sessions, discussing typical exam questions and few examples. Such sessions concentrate on general help with the approaching assignments and exams but do not attempt to provide model answers in advance.

Some topics are difficult to present through the media and in such cases, direct teaching may help. It may be that the topic benefits from face-to-face demonstration (possibly followed by practical work done by the learner). One of the strongest cases for additional face-to-face teaching is when affective learning is involved. When learners, particularly adults, are asked to evaluate and reconsider their opinions or attitudes, group discussion and interaction is essential. If learners at home have access to materials in several media, particularly if the course is designed as an integrated package, less reliance is put on face-to-face sessions. Thus, science experiments can be demonstrated on television and mathematical problems can be explained audio-visually with combined text and audio cassette. Even affective learning can be reinforced with dramatic presentations and discussions on radio or tape. We can therefore say that the more limited the access learners have to different media at home, the more likely they are to make use of supplementary face-to-face teaching in study centres.

Group teaching is designed to reinforce understanding may well include a review by the tutor of material covered at home but is more likely to concentrate on discussion of specific study problems experienced by learners. Such problems can be identified in advance by looking through assignments that the learners have submitted, or questions may be raised by learners during the session. Practical demonstrations, step-by-step analysis of problems, group discussions and question and answer sessions cannot be dealt with by the lecture method. Moreover, they all require small groups that are small enough for each learner to ask questions and for open discussion to take place. Most tutors coming to distance education have to learn to handle such small groups. As they work in groups, learners will learn to help each other. The tutor can encourage this, and thus facilitate the establishment of self-help groups. Through these various activities, the study centre becomes an important source of reinforcement and encouragement. Attendance may lead to improved course completion rates and better marks in examinations. It is, however, always necessary to remember that this supplementary assistance is only available to those who can attend. Those who are regularly unable to attend will need some alternative arrangements for support.

2. Teaching using Media

In some distance-teaching systems, learners watch video programmes or listen to audio cassettes in groups. This procedure may be adopted in countries where individual ownership of receivers is low, or it may be deliberately chosen as a powerful educational method. Recorded video or audio is under the control of learners and tutors who can stop or replay programmes when they wish. The tutor in the study centre should know how to explore these media, and this requires some training and guidance from the central institution. Tutors can use the media
as a stimulus for discussion or for thorough coverage of a topic, stopping or repeating segments as necessary. Once they have grasped the techniques of managing viewing or listening sessions, they need specific guidance, usually in the form of notes, on how to use each individual programme to its best effect. Recorded media can be particularly useful if specialist local tutors are in short supply. A non-specialist supervisor can learn to manage group viewing or listening sessions most effectively.

3. Individual Teaching

In most distance education systems, the main individual contact between the tutor and the learner takes place by correspondence, when assignments are marked. Feedback from the correspondence tutor is vitally important to the learner. Considerable attention is therefore paid by distance-teaching institutions to ensure that correspondence teaching is of high quality. Ideally, the correspondence tutor is also the tutor at a local study centre, and the learner has a chance for personal contact. But often the correspondence tutor and the face-to-face tutor are different. This means that when learners ask tutors about individual work-related problems, the reply is seldom based on a detailed knowledge of the individual learner’s performance. While local tutors will always try to help individual learners with their problems, in most cases, the number of learners is large and available time is so less, that individual contact of such kind remains occasional and informal.

Access to Resources

The study centre is an additional resource for learners. It is the first place that they turn to for finding the resources that need to supplement the materials they receive at home. Let us consider how far it may be possible to provide them. A ‘first category of’ additional resource is course-related items. A number of learners will want to go beyond the essential material and will want additional reading matter. This may consist of background books or articles referred to in the course texts, or items recommended by teachers, or reference books. The study centre might have a library and a space for reading. If possible, it should also have borrowing facilities. The supply of books to study centres is particularly important at the university level where reading is traditionally seen as a key learner activity.

Distance learners, especially those living in remote areas, very rarely have access to good libraries or good bookshops. However, it is never possible to supply many books to study centres as the cost is too high. Courses should therefore be self-contained and additional reading may be optional. Alternative sources of books also need to be explored, such as public libraries or a central book-loan system. Study centres should have recordings of all video or audio components of a course. If courses are broadcast, some learners may miss a broadcast and need to view a recording at the centre. Often learners want to replay a programme they have watched before. This could be the case after group viewing sessions as well as after watching a live programme at home. This makes certain topics easy to understand in a group. In addition, some courses require special components to be available in study centres, such as scientific equipment or computing activities.
A second category of resources relates to learners’ greater needs and future plans. They might need information and reading material to help them develop individual interests and decide on future study plans or careers. Thus, if possible, the centre should hold a range of information leaflets, general vocational and reference books. Learners will also refer to the library for the entire course material issued by the institution, to help select their next courses.

Learners need space to sit and study quietly; the right time to do so is when the centre remains open as the provision of such resources does not guarantee access. Help from a librarian or supervisor to identify the resources they need is also sought for. In certain cases, need for space for longer periods of time during a day cannot be ruled out. Providing such space has cost implications. Perhaps community involvement can help to some extent, especially in the rural areas.

**Contact with Other Learners**

A learner in a conventional institution has regular contact with others. Such contact enriches experiences, helps build up confidence, and contributes to enhance one’s know-how in handling assignments and examinations. The distance learner lacks this interaction most of the time, and it is important that it takes place at the study centre. As time at the centre is restricted, tutors need to make particular efforts to encourage activities in small groups and to stimulate learner-to-learner interaction. Of particular importance in this context are learner self-help groups who discuss their study together without the intervention of a tutor. Learners can learn a great deal from each other; this may come as a surprise, and groups rarely start spontaneously. The tutor at the study centre can help by convening a group or putting learners in touch with each other and by helping a group get started on its activities. The most important task is to convince learners that such groups are worthwhile.

**Administrative Activities**

So far, we have considered only the educational functions of a study centre. Centres also have some administrative functions, although these vary from country to country, institution to institution. Usually most of the administrative work is done at the regional or central levels. Let us simply note that local study centres may hold some records of local learners for local distribution of materials, appointment of local tutors and counsellors, and for conducting examinations.

**Regional Centres**

Let us look briefly at regional centres from a bottom-up perspective, that is, as centres which provide service to local study centres. A regional centre in distance education is intermediate between the central institution and local study centres.

Not all distance-teaching institutions have regional centres. Large open universities have generally chosen to establish them for better administrative
efficiency and to serve as a channel of communication between the central institution and the local study centres. Regional centres are established to look after clusters of study centres. For example, the UK Open University, has 13 regional centres, the smallest of which has 9 study centres catering for approximately 8,000 learners.

In India, the IGNOU has 22 regional centres, each catering to 5,000 to 15,000 learners, approximately, and 10-25 study centres per regional centre. Regional centres have important administrative functions, particularly organizing the operation of the study centres and the teaching in them at the local level. This may well include staff recruitment and the all-important briefing and training in distance education of such staff. Regional centres may also have a role in handling learner enrolments and records. The degree of responsibility will depend on the level of autonomy granted by the central institution to the regional centres.

Regional centres may engage in a variety of promotional activities in order to create more public awareness in the region and a positive attitude towards open and distance education among academics and provincial and local government officials and employees. Regional centres may further have a number of academic functions. Apart from the briefing and training of tutors as implied earlier, their academic staff may also serve as a source of specialist tutors for study centres. In some open universities, learners’ assignment responses are evaluated at regional centres. Regional centres may also be involved in the organization of term-end examination.

Regional academics are additionally in a good position to give feedback information to course teams on how the courses are received by learners, highlighting on the areas of difficulty, points which need further explanation and the problem areas. This type of feedback is an essential aspect in helping course teams to produce courses which are readily accessible to those studying at a distance.

Regional centres have an important role to play in counselling. They can act as the reference point for serious problems, sometimes resolving the problems themselves, sometimes sending them to the central institution. They may also organize summer schools, residential schools, field work, and laboratory work for the benefit of those learners who are geographically dispersed or whose numbers are low. One of the major functions of regional centres is to closely monitor the functioning of study centres of their regions in order to maintain and enhance the quality of support services provided to learners. Many regional centres organize annual convocations (degree awarding functions) such as UKOU and IGNOU. Regional centres may also be involved in promoting systems research and serve as resource centres for distance education in the region.

Facilities at the Regional Centres

The following facilities are usually provided by regional centres: reading room, audio room, audio equipment, reprographic facilities, information materials including bibliographical information, information about policies and programmes of the open
university, seminar room, the Internet and e-mail connectivity, library, student records, audio and video cassettes, dish antennae, books and journals, office equipment, training equipment and materials, records of study centres, stationery and office supplies and office furniture. The choice of equipment at a regional centre depends largely on the functions of the regional centre and the resources provided by the concerned open university.

**Staffing**

The regional director supervises the activities of the regional centre, and guides and coordinates all academic functions of the regional centre as well as the study centres. Under the guidance of the support services division at the headquarters and with the help of academic and non-academic members, the regional head conducts both the academic and administrative operations of the regional centre.

**Appointment and status.** The regional director is usually a senior academic appointed by the university following the approved selection procedures. He/she occupies a key position and plays a vital role in implementing the policies and academic programmes of the university. He/she is the representative of university in his/her region.

**Duties and responsibilities of the regional director:** The duties and responsibilities of the regional director in relation to the region assigned to him/her are as follows:

- Need to be aware about distance education system, the university’s policies, programmes and procedures.
- Management of the regional centre, in general, which include management of finances and accounts, as well as purchase, maintenance and utilization of furniture and equipment. This also includes: handling of admissions development; coordination and monitoring of support services network in the region; establishment of new study centres; supervision and monitoring of existing study centres including monitoring of counselling and assignments; liaison with state government, educational institutions and other organizations in the region, provision of support services at the regional centres; guidelines to study centres for their smooth functioning; staff development; training of regional centre staff, coordinators and assistant coordinators; orientation of academic counsellors; training of part-time administrative staff of study centres; supervising academic activities; development of region-specific programmes; support to schools in course writing; organization of seminars and workshops; programme evaluation; need-assessment and research; translation of materials; selection and appointment of academic counsellors; contribution in the development of new courses; development of administrative and academic systems at the regional centre; promotion and publicity of the university and its programmes; and the development and use of regional centre library.
• Maintenance of records such as student records, service records, equipment utilization records; data pertaining to study centres; records pertaining to counsellors, counselling data, feedback mechanism; feedback to headquarters on various activities including counselling, evaluation of assignments, academic programmes, orientation programmes and student grievances, interactive activities, meetings with heads of institutions, meetings with coordinators, counsellors, students, state government departments and also headquarters, official visits to study centres and follow-up activities.

Thus, the regional director occupies a central position in the delivery system of an open university. He/she serves as a vital and effective link between various schools and divisions at the headquarters on the one hand and the study centres on the other; between the open university and the respective state governments; between study centres and learners enrolled there, between counsellors and the coordinator and the learners; between the learners and various divisions at headquarters; between open university and the media; between the open university and other educational institutions; voluntary and private organizations located in that area; and between the open university and the general public. With his/her skilful dealings and prompt action, a regional director can alleviate the problems of the learners in the region, can create better support facilities for them and can generate proper public response for effective implementation of programmes in that region. The success of the university’s programmes and policies in the region largely depends on the pivotal role played by the regional director.

Functions of the Regional Centre

The principal functions of the regional centre can be broadly classified under three heads:

1. **Academic:** The academic activities of the regional centre encompass functions pertaining to admission, evaluation, maintenance of student records, selection and orientation of academic-counsellors, launching of new programmes, research and development of academic programmes wherever entrusted, organization of academic seminars and workshops, monitoring of counselling and assignments, conduct of intensive contact programmes and maintenance of library services. Distance educators all over the world are convinced of the view that regional centres should become academic centres rather than administrative units carrying out semi-academic and coordination functions alone.

As the regional centre is responsible for organizing and monitoring the open university’s programmes in the region, it is expected to undertake a variety of academic activities, both of routine and innovative nature. Apart from that it can play an important role in identifying, developing and implementing such academic programmes as may be required and feasible in the region.
For this purpose, the regional director must keep constant contacts with various academic and research institutions, other organizations, leading individuals in various walks of life and the state government.

A regular feature of the academic activities of a regional centre is the organization of seminars and workshops for promoting/further strengthening of the distance education system and also for obtaining greater involvement of the academic community of the region in the activities of the open university. Such seminars may discuss present developments and future possibilities in distance education in regional, national or global contexts as well as specific programmes/courses of the open university. These can be organized by the regional centre itself or in collaboration with other institutions/organizations at either the regional centre or any other suitable place in the region.

With a view to strengthening the existing academic programmes of the open university and helping the university in designing and developing new academic programmes, research in the following areas may be undertaken at the regional centre as an ongoing activity:

- **Programme evaluation**: This involves research on or evaluation of the open university’s academics by means of a sample survey through questionnaires and personal interviews with learners, counsellors, coordinators and other academic bodies. The data collected may be sent to schools/divisions concerned for taking, if necessary, remedial measures. This activity can go a long way in minimizing the dropout rates.

- **Selection and appointment of academic counsellors and other part-time staff of study centre**: It is one of the most important functions of a regional centre. The concerned schools develop the criterion for selection of academic counsellors which is followed by the regional centre in the selection process. Also, the appointment of part-time staff at study centres is the responsibility of regional centres.

- **Orientation and induction**: Orientating the newly appointed academic counsellors to the open and distance learning system, particularly to their specific tasks of tutoring and counselling is a vital activity performed by regional centres in collaboration with the concerned schools. Also organizing induction programmes for the part-time staff of study centres and more so for the distance learners (through its study centres), is a major responsibility of the regional centre.

- **Setting up a support services network**: Providing effective support services to all distance learners of the region, by informing, advising and counselling them is one of the key functions of the regional centre. Setting up a network of study centres and expanding the support services
network in the region, based on the distribution of learners, the nature of
the programmes and existing facilities available is again one of its most
important functions.

- **Student admission**: The regional centre is responsible for student
  admission in the region. Maintenance of student records is another very
  important activity. The regional centre also provides pre-admission
counselling to prospective distance learners.

- **Organization of counselling sessions, evaluation of assignments
  and examinations**: The regional centre is mainly responsible for the
  organization of counselling sessions, practical work, and so on, based
  on the specific requirements of the programmes being offered and
guidelines laid down by the concerned schools. It also supervises the
evaluation of assignments and conduct of term-end examinations at its
study centres and sometimes at the regional centre itself.

- **Monitoring**: Monitoring the academic and administrative services
  offered by the study centres is one of the most important functions of the
  regional centre. Providing regular feedback to the headquarters is equally
  important.

2. **Administrative**: The administrative activities of the regional centre include
appointment of staff at regional centres and study centres; maintenance of
records; purchase and maintenance of furniture and equipment; financial
management of the regional centre as well as study centres; maintenance of
library records; and preparation of budgets for the regional centre and study
centres. Payments to study centres for their staff and their activities is also
its major function. Periodic reviewing of the expenditure incurred by study
centres and stock verifications are other important activities. Regular
remittance of student fees to the headquarters is yet another vital function of
the regional centre.

3. **Promotional**: Promotional activities include adequate publicity of the open
university system within the region; developing suitable publicity material;
identifying journals for publicity; establishing regular contacts with various
institutions and voluntary organizations within the region; organizing public
seminars and symposia on open university system; participating in exhibitions
and book fairs; organizing radio, television and press interviews; arranging
regional director’s visits to institutions/organizations; liaison with state
government and voluntary organizations; and so on. These promotional
activities can be group-specific (for potential students and prospective
employers), programme-specific and time-specific (for example, during the
admission period). Thus, regional centres play a key role in the support
services being offered to distance learners.
Counselling Classes

The study centre has many functions and the learner returning home after a weekly session may well best remember a particular discussion or an excellent video, he/she has seen. It is at the study centre; however, that the learner has the best opportunities for counselling of all kinds as there is access to advice from subject specialists, help with study skills, information about choice of courses and assistance with non-academic problems. The environment of the study centre, the resources available and the way in which the contact programme is organized, all contribute to providing opportunities for counselling to take place informally and naturally for the learners.

In an academic set-up also, whether conventional or distance education, a teacher helps students academically and non-academically by providing various bits of information related to the institution’s rules, regulations, various administrative decisions related to admissions, examinations, and so on. Counselling is an assistance given by the teacher to the students to solve their problems, among other things. This assistance may be in the form of providing general information, giving advice on appropriate courses of action, helping the students to meet their needs, or solve their problems related to their study. In a broader sense, counselling constitutes all the three activities that is, informing, advising and counselling altogether. The only difference between informing and counselling is that high levels of information skills are needed in providing information to the students whereas counselling demands greater interpersonal skills. Informing is knowledge dependent whereas counselling is student dependent. Advising is dependent on both knowledge and students. Answering of questions depend upon the efficiency and ability of the distance teacher. Here, the teacher must be clear about the difference between teaching and counselling. Teaching is course-centred, and knowledge is communicated from the teacher to the learner. A classroom teacher must be a good speaker who can present the content effectively. Contrary to this, counsellor must be able to advise the students. It is purely student-centred. Here the communication starts from the learner and the counsellor responds. If you want to become a good counsellor, you should be a very good listener too.

Genesis and Need of Counselling

Counselling was introduced formally in this system in 1984. The International Council of Distance Education and British Open University held a joint Conference on counselling in 1984 followed by another conference in 1987. Later, the British Open University developed a range of correspondence, video and face-to-face staff development materials including a section on counselling. Similarly, the association of European Correspondence Schools has instituted a diploma in correspondence education which also contains a counselling module. Counselling is needed when a person tries to arrive at a decision but fails. In such a situation, he/she needs somebody’s assistance to do the same. In distance education system,
decision-making may range from choice of courses, time budgeting, preparation of assignments, betterment of grades, learning style best suited for independent study, and so on. Every distance learner needs counselling while working through the course material or studying through this mode. There are many students, especially in distance education system, who are confident enough to take decision on their own. But, in general, distance learners need help intaking decisions at various stages of their study. Counselling is also needed when a student feels any kind of difficulty in the process of learning. There are various types of barriers which may affect the learner’s study process. These barriers may be study-related (completion of assignment, preparation for examination, and so on); time-related (budgeting of time); personal (health, family problems in family, career/financial problems); and institutional (dealing in mailing, ill-suited rule/regulations). Besides, there are some extraneous barriers such as extra pressure of work, meagre educational opportunity at home, and so on. These barriers may cause anxiety.

To overcome these barriers let us understand better as to how the various barriers make the learner helpless and how a counsellor should be intelligent and mature enough to handle the student’s problems. There are various decision points which demand help in arriving at any conclusion. These decision points may range from initiating the courses to withdrawal or any other related motivational problem.

Organizing Counselling

Organizing counselling needs a full-fledged and well-organized channel of communication, trained personnel and physical infrastructure. Counselling is the liveliest aspect of student support services. It is done by a trained academic counsellor who is available at the study centre at specified timings to help/assist the learner if he/she is facing any personal academic and non-academic problem or barrier in the process of learning. In order to offer effective counselling, a well-organized network of study centres, regional centres and headquarters is necessary. Study centres are attached to the headquarters through regional centres. Study centres are the main workplaces of counsellors where they assist students through face-to-face interactions. The term ‘academic counsellor’ refers to one who teaches as well as advises through correspondence or who conducts face-to-face tutorial counselling sessions at the study centre. The duties and responsibilities of the academic counsellors are as follows:

- Catalyse further the academic discussion in the face-to-face sessions at the study centres.
- Respond to student queries, problems and doubts about the course material.
- Assist students to become independent learners by helping them to develop sound skills appropriate to distance education.
- Evaluate assignment responses, grade them and give feedback to students.
Distances Education

NOTES

Self-Instructional Material

- Encourage and support students to overcome the barriers to learning or to
take academic decisions. These barriers and decision points may be related
to their study, examinations, assignments, language as instructional medium
and so on.

In order to perform the responsibilities mentioned above, the academic
counsellor is expected to possess certain qualities. They are warmth, acceptance,
genuineness and empathy.

Besides the mentioned qualities, you need to possess certain skills as well.
You should master three essential skills—selection, listening and structuring.
Selection is nothing but the skill of categorizing student’s/learner’s response into
informing, advising and counselling. The second important skill a counsellor should
possess is listening. Keeping ‘mum’ or intelligent listening is the best way of
understanding. While listening the counsellor may ask open-ended questions,
acknowledge what the learner is saying, reflect and repeat what the learner has
said, and if needed, keep active silence when the learner is trying to express his or
her strong feelings. The counsellor should be able to do all these in such a manner
that the student may not feel disturbed or interrupted while saying something. The
third skill required is structuring, which consists of three stages—clarification,
checking and consequences.

Check Your Progress

5. What are the main functions of learners?
6. State any one function of regional centre.
7. What are the barriers which affect learner’s study process?

8.5 DIFFERENT CONTEMPORARY SYSTEM

The different contemporary systems of education are discussed in the following
section.

8.5.1 Correspondence Education

Correspondence education is another form of distance learning in which there is
exchange of study/teaching materials among students and teachers across the
country, say geographically from one place to another, by post. Under
correspondence course, students usually take up lecture notes, lesson plans,
textbook and problem sets from the teacher and after completing the assignment
they send it back to the teacher for grading.

Usually, in correspondence education, the exchange of assignment takes
place either through post or through electronic mail. The procedure adopted for
admission to the courses and examinations are more or less the same as have been in use over the centuries in the traditional college/university education. The mechanism of correspondence education is illustrated in Figure 8.1.

**Fig. 8.1 Mechanism of Correspondence Education**

**Advantages of Correspondence Education**

The advantages of correspondence education are as follows:

- In such a learning environment, student becomes self-directed and very active.
- This form of education system is easily scheduled.
- Here, self-instructional materials are easily available.
- Correspondence education generates flexibility. Students can complete the course from home as well.
- Correspondence course is economically affordable for everyone.
- With this system of education, there is learning while earning.
- It is good for drop-out candidates and women, especially housewives.

**Disadvantages of Correspondence Education**

The disadvantages of correspondence education are as follows:

- Correspondence course does not offer the entire desired course to the students.
- There is lack of physical interaction between teacher and students.
- In this education system, students contact is not encouraged which is very good for learning.
- Students are generally left alone under correspondence education system.
- Sometimes, it becomes tough to handle both work and course as a result of which one gets hampered.
Availability of Distance Education Courses

Distance education is present in many countries all over the world. It is practised in many subject areas. There are varieties of models for delivering instructions and guidance at a distance education. Some of the important models for delivering instructions and guidance at a distance education are as follows:

- **Traditional**: In this method, zero per cent online technology resources are utilized to deliver content or engage learners.
- **Web-facilitated**: Course is delivered primarily face-to-face, with a few per cent usage of online technologies such as utilizing a learning management system or Website to present syllabus and assignment information.
- **Blended/Hybrid**: Blended or hybrid is a combination of online and face-to-face methods in which there is delivery conducted via online resources such as online discussions, posting and submission of assignments online, multimedia lecture content available online.
- **Online**: The primary facilitation of the course is online, usually with no face-to-face meetings.

Everyone can easily avail the courses provided by the institution of distance education. Usually, the people who avail distance education are not in a position that enables them to be attending regular courses. They could be persons who have to work for a living in order to support themselves and often also their families, workers who want to complete their primary or secondary school education; or skilled workers and technicians who want to improve their vocational qualification. Also, the agricultural labourers who intended to move into a town and, therefore, wish to prepare themselves for a new occupation; workers in occupations which come to an end and who, therefore, wish to prepare themselves for a new occupation; workers in occupations which come to an end and who, therefore, need retraining; immigrants who wish to obtain citizenship of their new country and have to acquire specific knowledge about it.

Students who live in sparsely settled areas, children of farmers in isolated area can also avail the courses of distance education just like the students who live too far away from the nearest day school of their own nationality such as children of diplomats, missioners, military personal abroad, children of experts employed in developing countries, children of persons in itinerant trades, sailors or the children of immigrants who are to be instructed in their mother tongue.

Besides them, persons who are unable to attend regular schools for health reasons: sick persons who are bedridden, handicapped persons, or people who have to stay in hospitals for longer time can also avail the education through distance education system. Persons who are hindered from attending regular schools by the state: prisoners’ children and juveniles in reformatories can also be benefitted by distance education.
Apart from these five groups, there are distance students who do not come into this category. They might well be able to attend regular courses but prefer to enrol in distance education courses. Some do it in order to supplement the instruction of their regular school or to raise their level of general education; gifted students do it in order to reach an advanced level and still other people do it in order to find out whether they fit into a specific vocational pattern so as to clarify vocational options.

Finally, there are also teachers who study courses at a distance in order to inspire and prepare themselves for teaching. Usually, there are fewer students who wish to complete their secondary education in order to obtain entrance qualification for institutes of higher learning.

Thus, we find that every class of people can avail the use of distance education. It is easily available and easily accessible. It provides flexibility and abundant opportunity for individual to access education.

8.5.2 Open Education

‘Openness’ in terms of education has become an increasing feature of today’s educational system. The notion of open education was reflected not only in the pedagogical styles adopted but in physical layout of the school building as a whole and of age-related teaching areas in particular. The concept of open education refers to that kind of non-conventional education which has been weaning away from the conventional constraints that characterize the traditional school/college/university education. What makes an open education different from other form of education is its ‘openness’. In an open education system, anyone can get education anytime, despite of his qualification. Thus, open education system removes all the barriers of education from its system. For instance, in an open school anyone who has either passed or failed in any class (suppose Eighth Standard) can directly get promoted to Ninth Standard without any prerequisite.

This change is of the kind that was experienced a few centuries ago when sectarian education yielded to liberal education. This change was essentially curriculum based. Now, liberal education is yielding to open education. This change is both curricular and organizational in nature.

Characteristics of Open Education

The various characteristics of open education are as follows:

- It does not operate through traditional conventions which are essentially restrictive in nature.
- There are restrictions in admission.
- In an open education system, there are restrictions on attendance.
- There are restrictions on the candidature for examinations.
- There are restrictions on the period of time to be devoted to a course.
• There are restrictions on the number of examinations given and taken in a year.
• There are restrictions on subject combinations for a particular degree.
• There are restrictions on the mode of didactic communication and the didactic task.

It should be clear to us that correspondence/distance education institutes may or may not be ‘open’ in the sense we have referred to above or may be open only to a limited degree. And in the same way, even a traditional college/university may become open to a recognizable degree. Research programmes such as MPhil and PhD may be put under this category. In what follows:

(a) We shall avoid using the expression correspondence education, unless we have to use it in a specific sense.

(b) The expressions distance education and open education will be used synonymously. The distance mode allows the educational systems to be open and the openness of the education system suits for the promotion of distance education.

Advantages of Open Education

The advantages of open education are as follows:
• It develops a student’s autonomy and responsibility.
• It maximizes space through shared areas.
• It moves away from whole-class instructions to differentiated activities.
• It supports team planning, team teaching and team assessing.
• It facilitates social learning and peer-group learning.
• It reduces resource duplication.
• It encourages cooperative work.
• It supports flexible group size and membership.
• It avoids feeling of insecurity and isolation.
• It facilitates the sharing of ideas by students and teachers.
• It facilitates consistent and supportive handling of difficult student by more than one teacher.

Relation between Distance Education and Open Education

The relationship between distance education and open education is that open education can be effected easily through distance education systems on the one hand, and on the other advances in the practice of distance education help and encourage education to become more and more open. Naturally, the two go together, and therefore, there is a visible ‘overlap’.
Distance Education

Distance education is characterized by a non-conformist and non-traditional approach, which, in effect, questions existing norms of traditional education and seeks to provide a new orientation to the education process. It assumes premises about the nature of learning that are vastly different from those governing the traditional system of education. Moreover, it has its own dialectic register which arises out of its endeavour to overcome the problems that are implicit in imparting instruction to students who are at a distance from the teacher and/or the institution.

Distance education does not exist in a vacuum. It is, in fact, an outcome of certain socio-historical compulsions and technological growth; it is a system, which is firmly related to social and cultural environments. The most important development in this regard is the advancement made in the field of electronic mass media. For instance, technological growth opens up new channels of communication which, when put to use, can replace the usual channel which is of oral communication.

There are different terms that have been used for denoting the concept of distance education. Some of the well-known are ‘distance education’, ‘distance learning’, ‘distant teaching’, ‘tele-work’, ‘tele-learning’, ‘outreach’, and ‘tele-teaching’. All of them have been used to describe the same basic process and outcomes. It usually takes place when teachers and students are separated by physical distance, and technology like voice, video, data and print are used to bridge the instructional gap.

Attempts have been and are still being made to define distance education succinctly. It is, however, very difficult to arrive at a definition that may bring together, by the process of connotation and denotation, all the aspects that characterize distance education.

A pioneer in the field of independent and distance learning, Charles A. Wedemeyer (1977) used the terms ‘opening learning’, ‘distance education’, and ‘independent study’ in his work, but favoured the last term consistently. According to him: ‘Independent study consists of various forms of teaching, learning arrangements in which teachers and learners carry out their essential tasks and responsibilities apart from one another, communicating in a variety of ways. Its purposes are to free on campus or external learners with the opportunity to continue learning in their own environment, developing in all learners the capacity to carry on self-directed learning the ultimate maturity required of the educated person.’

While defining distance education, the famous thinker Borje Holmberg stated: ‘Distance education covers the various forms of study at all levels that are not under the continuous, immediate supervision of tutors present with their students in lecture rooms or on the same premises but which nevertheless, benefit from the planning, guidance and teaching of a supporting organization.’

Well known contributor to the field of distance education, Otto Peters emphasized the role of technology, saying that distance education is ‘a method of imparting knowledge, skills and attitudes. It is rationalized by the application of...’
division of labour and organizational principles as well as by the extensive use of technical media, especially for the purpose of responding high-quality teaching material, which makes it possible to instruct great numbers of students at the same time wherever they live. It is an industrialized form of teaching and learning’.

For distinguished professor and contribution to the field of distance education, Michel Moore, the related concept of ‘distance education’ was defined as ‘the family of instructional methods in which the teaching behaviour are executed apart from the learning behaviour, including those that in a contiguous situation would be performed in the learner’s presence, so that communication between the teacher and the learner must be facilitated by print, electronic, mechanical, or other devices’.

Famous pioneer of adult and distance education, Ginther Dohmen of Germany defines distance education as a ‘systematically organized form of self-study in which student counselling, the presentation of learning material and securing and supervising of student’s success is carried out by a team of teachers, each of whom has responsibilities. It is made possible at a distance by means of media, which can cover long distances.’

It should not be assumed that there are no other definitions except the few we have discussed in this section nor do we suggest that anyone or a combination of any two or more of the mentioned definitions actually describe distance educations comprehensively. There are other definitions too, and many more will come up as we explore this innovative system of education. The main concept of the various definitions gives the same outcome, that is:

- Under distance education, the teacher and the learner are separated from each other and this is the central characteristic of this form of education.
- Distance education is an institutional kind of educational system. It is, therefore, distinct from private study, which may result from private reading or watching TV, or attending a talk and so on.
- Distance education makes use of various technically advanced media such as printing, telephone, audio-video, computer and broadcasting.
- It is a two-way communication because the student is able to respond through assignment-responses or other media and, therefore, can receive feedback. The student, thus, enters into a dialogue with the institution.
- Each student is separated from his/her peer group in the sense that although the learners are from a fairly sizable population, they do not have face to face interaction amongst themselves. Thus, distance education becomes a highly individualized learning system. In this sense, it remains one of the most individualized of all education systems. Even though study groups may be formed under distance education learning programmes, these may not be compulsory, and the student is free to work entirely on his/her own.
To be effective, the technology of distance education should remain relatively transparent, allowing the instructors and students to concentrate on the process of teaching and learning.

Unfortunately, due to the captivating nature of many distance delivery technologies and techniques, faculty, students and administrators can easily become distracted by the opportunities and limitations of the delivery system and lose sight of the academic needs to be met. In fact, if faculty staff and students are constantly being reminded of the technological delivery system itself, either through technical problems or through impressive but unnecessary technological capabilities, they will be distracted from effective teaching and learning. For this reason, it is critical for the distant educator to remain firmly focused on the instructional goal, content requirements and student needs.

Still, it is easy to get bogged down with the notion of distance and falsely assume that bridging relatively long distances requires more planning and effort than teaching over short distances. Although, this makes sense initially, further investigation leads to the realization that the same challenges must be faced and difficulties overcome whether students are two blocks, two miles, or two time zones away.

In fact, whether the course is delivered face-to-face or at distance, critical instructional elements remain unchanged. These include organizing, planning, understanding student needs and characteristics, developing content and gaining familiarity with presentation methods.

An effective distance education begins with careful planning and an understanding of the course requirements and students’ needs. Appropriate technology can also be selected once these elements are understood in detail. A fully functioning distance education system requires the consistent and coordinated work of administrators, faculty, on-site facilitators, technicians, and support personnel.

While each individual plays a different role, they have a common goal which is to provide relevant and well-planned distance learning experiences to a selected group of learners.

**Need of Distance Education**

There are various reasons for the growing popularity of distance education. Some of these are as follows:

1. **Over-population**: Over-population in most of the developing countries has led to the emergence of a large number of students. But, the number of formal institutions and seats are limited; as a result of which most of the students have to wait for another year to take admission in institution in the subject of their choice. But now the circumstances have changed and with the emergence of distance education, students can look for multiple options in various educational institutions at the right time without needing to wait.
Distance Education

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2. Knowledge explosion: The concept of distance education provides an opportunity to gain ample knowledge on varied subjects, of which most of the students around the world are not in a comfortable position to attain differently. Thus, distance education acts as a tool for explosion of knowledge.

3. Qualification enhancement: Distance education also enhances the qualification of many people who are either looking for a job or are looking for a better job. There are many people who while working want to improve their qualification to get promoted in their job. Hence, for them distance education is the right platform. It gives an opportunity to the working-class people to gain qualification easily without hampering their job.

4. Double access: There are many people who have to work at very early age due to many social and economic reasons. Such person does not get an appropriate chance to study at the right time. Therefore, for such people, distance education acts as a boon. While working they can study too. Thus, they have dual access of both job and study.

5. Geographical segregation: Due to undeveloped communication systems, there are several places on earth that remain untouched by new educational courses. The complete geographical segregation of the place leads to unawareness about new and vocational courses that are emerging in several educational institutions. In such places, the concept of distant learning acts like a boon. It gives new opportunities to the students.

6. Financial circumstances: Distance learning also meets the demand of those people who are financially unstable or whose economic condition is not very sound. In most of the educational institutions, the fees of the distance learning courses are usually low in comparison to regular courses.

7. Self-improvement: Proper education leads to self-improvement. Therefore, distance learning is also very much needed for self-improvement and self-learning of an individual.

8. Easy availability: The access to distance education is very easy. One can easily avail any course at particular time under distance education from any university.

Importance of Distance Education

Education is very important for every individual. It not only enhances individual’s personality but also offers opportunities for a better future. Distance education is a product of a continuous development that started well over a century ago and is of great importance for today’s and future students. Here, we are going to deal with some of the points which will show how important the concept of distance education is. These points are as follows:

1. Teaching at a distance can be effective: If teaching techniques and delivery methods takes into account the needs, diversity, and context of distance learner, teaching at distance can be effective.
2. **Concept of distance education understands the requirements of students:** The concept of distance learning understands both urban and rural students, regional as well as national and international students and provides equal opportunity to all of them. It also provides an opportunity to exchange social, cultural and provisional heritage of person from a particular cultural background to another.

3. **Distance education is a boon for service aspirants:** Distance education has become a boon for most of the service aspirants. It is very important for those people who due to their service are not able to achieve their desired goal during their student life. This is the most important platform for most of the skilled people to rebuild their academic quality in later stage.

4. **Distance education enhances economic and official status:** Distance education is also very important for enhancing the position in respective area of job and profession. In addition, it also provides financial gain consequently by raising an individual’s position in an office.

5. **Distance education is suitable to all age group:** There is no age bar while acquiring degree through distance education. It is suitable for all age group.

**Characteristics of Distance Education**

Distance education means that the learner is physically at a long distance from the teacher for much, most or even all of the time during the teaching/learning process, in contrast to educational communication in a classroom situation which is ‘contiguous’. This new system of education may be visualized in the following characteristics:

- Distance education is a needed component of most national educational systems.
- Distance education is a coherent and distinct field of educational endeavour.
- Distance education embraces programmes at a distance at the primary and secondary, technical and further, at college and university levels in both public and private sectors. It has existed for somewhat over hundred years and is to be found in most countries.
- Distance education provides a complete educational programme for both adult and children outside of, and distinct from, conventional, oral, group-based provision. It has its own laws of didactical structure and its own quasi-industrial administrative procedures.
- Distance education is a form of education fraught with problems for administrators, teachers, and students. It is characterized by the fragility of the non-traditional in education. This difficulty concerns the quantity, quality and status of education at a distance. Good practice in distance education seeks to provide solutions for these inherent difficulties.
• Under distance education, the learners have to take much greater responsibility for learning than they were used to.

• There is a wider choice of the content under distance education. It is the method that has to be provided to the learner.

• Here, individuals’ differences among the learners have not only being recognized, but also catered to.

• Learners have their own pace to complete or working through the courses. They may start, stop, and/or complete the courses according to their own convenience and abilities.

• Under distance education, evaluation of student performance should be independent of the consequences, methods and place.

• Teachers concentrate on educational tasks by withdrawing from social and administrative tasks. They should function more as managers of educational materials than as the traditional sources of all correct information and knowledge.

• Teachers accept the role of the educational media as a role complementary to their own. The implication is that the course/material to be reconceived and designed afresh.

• The educational operation should affect a judicious media-mix-using all the media and methods. This should be one of the major principles of course design and production.

• The system operates wherever the learners are independent of the domicile and grouping characteristics of the learner.

Check Your Progress

8. Define the term ‘correspondence education’.

9. What are the main characteristics of open education?

10. Why is distance education considered as a boon for service aspirants?

11. State the relationship between distance education and open education.

8.6 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. The main objective of distance learning is democratization of education. Better access, lower costs, greater flexibility, high quality are some of the objectives of open and distance learning.

2. In the words of Professor Perraton (1981), distance education is ‘an educational process in which a significant proportion of the teaching is conducted by someone removed in space/or time from the learner.’
3. The Open learning system aims to redress social or educational inequality and to offer opportunities not provided by conventional colleges or universities. Educational opportunities are planned deliberately so that access to education is available to larger sections of the society.

4. Transaction of the curriculum is effected in distance education by means of specially prepared materials (self-study-learning materials) which are delivered to the learners at their doorstep through various forms of media such as print, television, radio, satellite, and audio/video tapes, CD-ROMs, the Internet and World Wide Web.

5. The following are the main functions of learners:
   a) Learners are to be equipped with the study skills required to cope with distance learning.
   b) Learners’ problems and difficulties in understanding the subject matter are to be dealt with.
   c) Learners are to be made aware of practical work.
   d) Learners may be encouraged to learn from each other.
   e) Learners may be familiarized with the concept of individual teaching.

6. The regional centre is mainly responsible for the organization of counselling sessions, practical work, and so on, based on the specific requirements of the programmes being offered and guidelines laid down by the concerned schools.

7. The barriers which affect learner’s study process are study-related (completion of assignment, preparation for examination, and so on); time-related (budgeting of time); personal (health, family problems in family, career/financial problems); and institutional (dealing in mailing, ill-suited rule/regulations).

8. Correspondence education is another form of distance learning in which there is exchange of study/teaching materials among students and teachers across the country, say geographically from one place to another, by post.

9. The main characteristics of open education are as follows:
   a) It does not operate through traditional conventions which are essentially restrictive in nature.
   b) There are restrictions in admission.
   c) In an open education system, there are restrictions on attendance.
   d) There are restrictions on the candidature for examinations.

10. Distance education has become a boon for most of the service aspirants as it is very important for those people who due to their service are not able to achieve their desired goal during their student life. This is the most important platform for most of the skilled people to rebuild their academic quality in later stage.
11. The relationship between distance education and open education is that open education can be effected easily through distance education systems on the one hand, and on the other advances in the practice of distance education help and encourage education to become more and more open.

8.7 SUMMARY

- Distance education is an alternative way of learning; providing education at a large scale besides having the conventional system of learning.
- The open and distance learning (ODL) system is the only corridor through which those sections of population who were once deprived from the purview of higher education in conventional system for one reason or other, can pursue lifelong learning in a flexible and cost-effective mode.
- Distance Education (DE) comprises of all the teaching learning arrangements in which the learner and the teacher are separated by space and time.
- The Expert Committee recommended the institution of correspondence courses in view of the greater flexibility, economic viability and innovative methods of imparting education.
- Distance education methodologies can break the boundaries of time and place and offer a flexibility that enables people in different circumstances to enjoy the advantages of education.
- Distance education has many sub-systems. Counselling is one of the sub-systems of the overall system of distance education.
- A study centre is a part of an overall system of support for learners. It includes basic learner support along with teaching-learning materials.
- Usually a distance-teaching institution employs part-time staff in its study centres. The first need is for a coordinator with administrative and supervisory responsibilities.
- In distance education, some of the teaching method in study centres is similar to teaching in conventional education. But such teaching only covers selected topics, while learners spend most of their time in the centre engaged in other activities.
- Group teaching is designed to reinforce understanding may well include a review by the tutor of material covered at home but is more likely to concentrate on discussion of specific study problems experienced by learners.
- Regional centres may engage in a variety of promotional activities in order to create more public awareness in the region and a positive attitude towards open and distance education among academics and provincial and local government officials and employees. Regional centres may further have a number of academic functions.
Regional centres have an important role to play in counselling. They can act as the reference point for serious problems, sometimes resolving the problems themselves, sometimes sending them to the central institution.

Counselling is an assistance given by the teacher to the students to solve their problems, among other things.

Organizing counselling needs a full-fledged and well-organized channel of communication, trained personnel and physical infrastructure.

Correspondence education is another form of distance learning in which there is exchange of study/teaching materials among students and teachers across the country, say geographically from one place to another, by post.

Distance education is present in many countries all over the world. It is practised in many subject areas.

The concept of open education refers to that kind of non-conventional education which has been weaning away from the conventional constraints that characterize the traditional school/college/university education.

Distance education does not exist in a vacuum. It is, in fact, an outcome of certain socio-historical compulsions and technological growth; it is a system, which is firmly related to social and cultural environments.

Distance education is a product of a continuous development that started well over a century ago and is of great importance for today’s and future students.

8.8 KEY WORDS

- **Counselling**: It refers to a form of assistance given by the teacher to the students to solve their problems, among other things.
- **Distance education**: It refers to a mode of learning through which education can be accessed by the people irrespective of geographical barriers, physical existence of teachers, space, time and age.
- **Open education**: It refers to that kind of non-conventional education which has been weaning away from the conventional constraints that characterize the traditional school/college/university education.
- **Study centre**: It refers to a part of an overall system of support for learners. It includes basic learner support along with teaching-learning materials.

8.9 SELF ASSESSMENT QUESTIONS AND EXERCISES

Short Answer Questions

1. Write a short note on the meaning of distance education.
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2. Why is study centre an additional resource for learners?
3. What are the objectives of distance education?
4. List the equipment required in study centres.
5. Why are regional centres established?
6. What are the main functions of regional centres?
7. How is distance education characterised?

Long Answer Questions

1. What are the main strategies involved in distance education programmes? Discuss in detail.
2. Explain the development of distance education in India.
3. Identify the main functions of study centre.
4. Describe the various facilities available at the regional centre.
5. Interpret the responsibilities of academic counsellors.
6. Discuss the advantages and disadvantages of open education.

8.10 FURTHER READINGS


9.0 INTRODUCTION

Education depends upon two-way communication. Accessing or assimilating information is not sufficient. In distance education, there is a growing need and appreciation of sustained two-way communication in the process of analysing and developing knowledge. Interactions between the learner and the teacher/institute and among the learners rely on the available communication technologies. The institution needs to focus on the packaging and delivery of knowledge for the independent ‘distant’ learner and strive to improve the nature of human-to-human and human-to-machine interaction in the learning process.

In this unit, the significance and need for learner support services in distance education has been explained. The process of course planning and its development have been discussed. The unit will also analyse the role played by audio-visual aids and electronic devices in distance education.

9.1 OBJECTIVES

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

- Explain the various resources of distance education
- Analyse the features of distance education system
• Interpret the considerations to be taken while deciding the choice of media for distance education
• Discuss the process of course planning
• Identify the aspects of course development
• Describe the importance of radio, television, satellite, the Internet and SITE in promoting distance education

9.2 DISTANCE LEARNING: RESOURCES FOR DISTANCE LEARNING

In today’s time, distance education is one of the most rapidly growing areas in education and training. The pace of growth of distance education has been greatly influenced by developments in communication and information technologies and these have accelerated significantly. Freedom from the constraints of time and space has provided an added incentive to large numbers of people, who are vastly heterogeneous in character and attitudes, to pursue different programmes of their choice and meet a variety of needs.

Throughout the world, in the last few years, there have been certain major trends in the provision of education and training. These include significant reforms in educational theory and practice; diversification of the resource base for education including privatization; progressive globalization of education leading to greater collaboration and networking; and above all, the emergence of distance learning as a major instrument for meeting the aspirations of a vast number of people in a knowledge-driven world economy. The management of dynamics of distance education systems has to struggle with a wide variety of issues and concerns. These include: mission and purpose of the system in the context in which it operates; programmes and their curricula; strategies for teaching and learning; organization of the infrastructure for communication and interaction with students; choice of technology; policies regarding students and staff; development and distribution of study materials; and funding and establishment of the credibility of the system itself. Some of the issues have been discussed in the following sections of this unit.

The Managements’ Perspective

Variations lie with regard to purposes, size, technologies, efficiency and patterns of management of distance education. They also vary in structure and organization. The management of distance education systems need to address the tasks as the implementation of several integral components of a complex system. All other components of the system are influenced directly by the ways in which decisions are taken and implemented in any of these components. For example, the systems of delivery and student assessment procedures are determined by the choice of programmes; the enrollment levels depend upon the management’s assessment of the market needs that influenced the choice of programmes; and the professional
acceptance and recognition of the graduates produced by the programmes is determined by the detailing of the curricula. Also, the recruitment of staff and allocation of other resources which have to be consistent with the objectives, structures and levels of each programme; relevance both to the environment and the needs of the programmes are influenced by the choice of media and technology support available. Even reliable and efficient support systems have to be in place for the implementation of all programmes.

**Variation in the Needs of the Client**

Today, knowledge is the most critical input for all enterprises. Man is finding it increasingly impossible to cope up with the assimilation of knowledge even if it may be only in selected fields with the current explosion in knowledge. Continuing education and lifelong education is the only answer as the traditional approach to education can no longer equip people to meet the challenges of life and work in today’s world. Moreover, it is practically difficult for people to take time away from their family and work to pursue programmes of education and training which are traditionally confined to the classrooms. They need to learn at their workplace or at their homes, free from the constraints of time and space.

Continuing education is a rapidly expanding area of growth for the distance education system. The motivation for learning is becoming increasingly diverse. The traditional forms of work are changing. There is a constant growth in all forms of work with the application of technology. It is important for most people to familiarize themselves with these technological applications for their own professional work and growth. Employees would want their workers trained in newer technologies which are being inducted for improving productivity and efficiency of their organization. Many working people would want to be trained in newer technologies to enable them to change their jobs or change their organizations. These motivational variations determine the size and quality along with the heterogeneity of the learner groups in the distance education systems.

In addition, there are groups which are suffering from several disadvantages or disabilities. The economically, educationally, geographically, and socially, disadvantaged as well as the groups of physically disabled form a bigger group. All of them need education and training in order to overcome their disadvantages and disabilities and live a fuller life.

Vocational education and training can also get support from distance education. A major contribution made by distance education for many years in several developing countries is in the area of training unqualified or under-qualified teachers. Some 40 developing countries of the world had established teacher education programmes through the distance mode by the mid-1980s (Nielsen, 1990). Training programmes for company employees is another area in which distance education methods have made a significant contribution. For example, the National Technological University, USA, provides access to the graduate engineering courses of 29 universities to the employees of large corporations and...
government agencies which purchase access to the University’s Satellite-delivered broadcasts (Rumble, 1992). It is this multiplicity of learner groups and learning needs that constitute the potential market for distance education.

**NOTES**

**Reaching the Emerging Needs**

The management has to consider ways by which the wide range of needs after their identification can be converted into markets by the distance education system. A market will emerge only if there are products (goods or services) and there are buyers whose needs can be satisfied by those products.

After looking into the heterogeneous nature of the learner groups and the variations in their motivation to pursue programmes of education and training, it is extremely important for the educational provider to respond to these varying groups and their motivations, and customization of the products (in this case, programmes of education and training) to a certain degree becomes inevitable. This would mean categorizing the markets into broad categories to provide for programmes in the same field at different levels (certificate, diploma, degree); learner groups by the levels of their previous educational attainments; and positions (literate, school drop-out, secondary, post-secondary), working people by their professional fields, and so on.

For being dynamic, a distance education system needs to be flexible. This flexibility is as much a function of its structure as its methods. A forward-looking distance education system would provide for a modular structure for its programmes with multiple points of entry and exit so that a potential learner can choose a module or a number of modules which will best satisfy his/her perceived needs with provision for moving on to the next module(s) as and when he/she feels the need to do so.

**The Student Profile**

Distance education managers need to have a clear perception about their students and their characteristics. For example, they could be a group of employees of a large firm, or a large number of individuals scattered over vast distances. It is important and many decisions will depend upon this vital knowledge input. For example, the kind of delivery and support systems to be established, the kind of technology to be used, the level of fees to be charged, and so on will all depend upon the special characteristics of the learner groups to whom particular programmes are addressed.

It is clearly not practical to start a programme, enroll students and then study their profiles to design delivery systems. In order to provide for delivery and support systems to match the characteristics of particular groups, the distance education management has to anticipate the unique characteristics. For example, a programme addressed to learners who have had no significant previous educational attainment has to provide for a greater face-to-face component in the delivery system by the way of interactive guided learning while a graduate
professional education programme could possibly be offered such facilities through satellite-delivered communication packages with no face-to-face contact at all. The question of choice of technology is most suitable here. The main factor in the selection of technology is its accessibility. If the technology is not easily accessible to large numbers of learners, this expensive technology medium cannot constitute an effective delivery system.

The learners' locations and environments are important considerations in designing the delivery systems as far as the distance education management is concerned. For example, video cassettes played on TV sets is effective technology medium compared to satellite-delivered synchronized teleconferencing models using one-way video and two-way audio communication systems. This would be a low-cost for widely dispersed learner groups, many of whom are in remote locations in rural areas. The size of the student groups is an important factor.

A unique feature of distance education system is its ability to reap economies of scale. The learning packages of the system can be used for an unlimited number of students that too for a reasonably long period of time. For every additional student enrolled, the marginal cost is only the additional production and distribution cost of the material. In other words, the initial investments made in the development and preparation of the material get spread over a larger number of students and over a period of time, thus offering substantial gains in economy for the system. On the other hand, if the number of students is too low, there will be no economy of scale and the unit cost will be very high. It is essential that the management is active in addressing the issues of the size of the learner groups before making any significant investments in developing new programmes.

**Choice of Media to Reach the Students**

Distance education is essentially a form of mediated teaching and learning in which the learner and the teacher are separated by time and space. Over a period of time, this system of education exploited to the maximize the emerging technologies, incorporating them into the teaching and learning environment, beginning with radio and television, and later audio and video recording. With the emergence of new technologies, distance learning environments are evolving into virtual classrooms where instructions are delivered from a host site to distant sites using a combination of live, two-way interactive audio and video communication system. Computer-based interactive interaction through Local Area Networks (LAN) and Wide Area Networks (WAN) as well as the Internet has added a new dimension to the previously available distance education technology.

There were several stages of intermediate technologies in this process of evolution. Taking into consideration the easy availability, accessibility, affordability, and also the responsiveness of the environment to its use, the application of a particular technology was determined. The use of media differs in developed and developing countries. Thus, while satellite-delivered telecommunication technologies and computer-based communication networks characterize the delivery of distance
education programmes in the developed countries, distance education delivery in
the developing countries relies heavily on the printed text supplemented on a limited
scale with radio and television broadcasts and the use of audio and video recordings.
The following are the major considerations for the distance education managers
while choosing the media to apply appropriately:

- Only those media which are accessible to the learners should be used. It is
  not just the availability of a medium that is important, but the medium that is
  or likely to be most used by the learner groups.

- The affordability of accessing a particular medium both for the provider
  and the student. For instance, in several cases, even if the equipment and
  other hardware can be acquired, the professional and technical competence
  required for producing the software may not be available locally. Also, the
  priorities of the television channel owners may not match the priorities of
  educational providers.

- The pedagogical significance of particular media. Not all learning needs to
  be technology-mediated. In most of the cases, printed texts may serve the
  purpose. Where teaching needs demonstration, video tapes that can be
  replayed as and when required is a better substitute for face-to-face
  interaction than videos delivered through the broadcast mode.

- The judgment of the management about the method from which the students
  can learn best.

Technology and Efficiency

The size of the distance learning systems varies enormously. Each of the 10 open
universities in the world which are considered mega universities admits more than
100,000 students every year. There are also very small systems catering to a few
students, often no more than 10 or 20. Whatever be its size, distance education
enables a small number of teachers to reach to a large number of students. This is
possible because in distance education, materials and media substitute the efforts
of the teacher in the classroom. For distance education management, labour-
intensive process of conventional teaching and media-driven diffusion of materials
are swapped off, thereby achieving economies of scale. The economic investments
made on the development of materials are spread over large numbers of students
and the same course materials can be used for several years. It is this feature of
the distance education system that makes it cost-efficient. The diffusion technologies
alone do not make the distance education efficient, but employs a variety of
technologies in its administration and management as well.

Most distance education institutions today use Desktop Publishing (DTP)
techniques for their course development and production; depending upon the size
of enrollment, it resorts to ‘just-in-time’ production methods for low enrollment
programmes and bulk production and warehousing for high enrollment programmes.
Electronic transfer of materials, production of materials on CD-ROMs, online
access to information and materials, walk-in admissions, on demand examinations, on-line student assessment and grading, and so on, are increasingly becoming a part of the management culture of the distance education systems which make them both efficient and learner-friendly.

Check Your Progress
1. State any one feature of distance education system.
2. Why is flexibility an important aspect of distance education system?

9.3 PRINT AND SELF-INSTRUCTIONAL MODULES (SIM)

Learning through self-learning texts is different from any other kind of teaching. The kind of writing required for such materials is quite different from that used in writing a lecture or an article for a journal. In distance-learning situations, what is most important is to keep the ‘learner’ in mind and imagine that we are tutoring an individual learner. As writers, we would like the learner to remain engaged in activities which go beyond textbook learning, and gradually to become more open and critical. The self-learning material should:

- Help the individual learners find their way into and around the subject by repeating the content in different ways and at different stages.
- Tell them what they need to do before going through the material.
- Make clear what they should be able to do on the completion of the material (i.e., in terms of objectives).
- Advise them how to tackle the work (i.e., how much time to allow for different sections, how to plan for an assignment).
- Explain the subject-matter in such a way that the learners can relate it to what they already know.
- Encourage them sufficiently to make whatever effort is needed in coming to grips with the subject.
- Engage them in exercises and activities that make them work with the subject matter rather than merely read it.
- Give the learners feedback on these exercises and activities enabling them to judge for themselves whether they are learning successfully.
- Help them to sum up their learning at the end of the unit.

Course Planning

It is very important to plan the writing of a course carefully and well in advance. In face-to-face teaching, it is easy to make on-the-spot adjustments in teaching strategies.
which will suit the needs of different groups of learners which is not possible in distance teaching. The teaching material is prepared in advance, and the distance learners do not have the teacher with them to help them to study from the content. The suitability of the materials must be decided before they are written. For this reason, systematic planning is essential in preparing distance educational self-learning material.

The process of course planning comprises the following stages:

1. **Assessment of needs**: The first stage of planning is the assessment of educational needs. When we talk about educational needs, we have in mind education in its broad sense. By saying that an educational need exists, we mean that there is the lack of some input which an educational programme can help to provide. For example, any technical worker may want to continue his or her education to enhance his productivity and ensure better growth opportunities for himself or herself. Even if the facilities are available, they may not be able to use them because of certain constraints such as shortage of time or a difficult location.

   Educational needs are assessed through surveys and formative evaluation. Different research techniques should be employed for the purpose of collecting information. This is particularly true of rural areas. Once the needs are assessed, a detailed and explicit plan for the particular educational project must be worked out. This requires a description of the project/course, indicating the anticipated problems. We need to know the details of the potential learners, such as their learning behaviours, their living, educational backgrounds and their occupations. At the planning stage, we must stress upon the importance of analysing the entry behaviour of the learners, i.e., what they already know, and what they can do at the start of a course. A detailed statement of the entry behaviour helps us both to plan writing and to give guidelines to the course development team, which consists of the writer and the editor and also guide us in the approaches to be adopted.

2. **Defining objectives**: The second step is to specify the objectives thus to set precisely define what we wish to achieve. The definition of objectives is the key for course developers. It is a difficult but crucial part of the whole process of developing materials, since later decisions will depend on the way the objectives have been defined and whether they are relevant to the learners’ context.

3. **Analysing resources and constraints**: A clear picture of the resources should be there before going for detailed plans and other constraints should also be kept in mind. In the first place we should keep in mind the budgetary provision for the course. All the expenditure must fall within the budget at our disposal and we must set out our objectives accordingly. Secondly, we have to consider the availability of media that is how much course will be covered by text materials; which way will be best suited, face-to-face...
contact/broadcasting facilities/requirement of specific electronic gadgets. These few questions have to be looked into at the planning stage. These considerations have direct and important implications for course design.

The third factor is the delivery and reception of teaching materials. This includes distribution of teaching materials to learners through postal services, regional centres or any other available means. Taking all these factors into consideration, we may have to modify our priorities and the overall objectives we had originally set for ourselves.

4. Alternative methods and selection of criteria: At the next stage comes the selection of alternative ways to meet the objectives. This includes preparation of an outline of requirements for example, media and administrative arrangements. Studying the forms of the materials and their relationship with each other (i.e., whether the audios and videos are integrated or supplementary or complementary). It also includes decisions related to choosing of the evaluation procedures, selection of suitable strategies to achieve the objectives, defining the criteria by which to choose between alternatives, including learner preferences, educational effectiveness, cost, timing, risks and policy.

One of the important decisions to be taken is the choice of media for effective in achieving the objectives. Generally, print media is used in the form of informative booklets, while radio and television programmes may also be used. In case there is no printed material available, broadcasts may be used as the main means of sending the messages or information. All the components will need to supplement and complement each other.

5. Developmental trials: It is obviously ideal to try out a course as a pilot programme before it is finally printed. Even if it is not feasible to try out all the self-learning material in a pilot version, it may be possible to try out part of it on a small group of learners and to draw upon their reactions to improve the course material. After incorporating the modifications suggested by the learners, the course may be given its final shape, and sent it for printing.

6. Evaluation: Evaluation/assessment may take two forms:

(a) Assessment of courses by learners themselves: A brief questionnaire seeking information regarding the quality of the study units may be sent along with the materials, and the students asked to respond. The responses received should provide an idea of the strengths and weaknesses of the materials from the viewpoint of the students. Improvement should be the motive of this assessment.

(b) Assessment of courses by second person (tutor, trainer or counsellor): It is extremely important to evaluate courses and judge how far they are meeting the educational needs which were identified in the beginning of the planning. It should be possible to design
worksheets on a course so that the tutors may provide some information about its effectiveness.

7. Feedback: Feedback is of utmost importance at each and every stage of the process of developing teaching materials. The feedback of learners is used to make the text more suited to their needs. As there is no single perfect way of achieving the objectives, it is assumed that there is no single solution to a problem which is difficult to be tapped in a single go. As a result, the feedback can be used to improve upon the self-learning material. The learner lacks the immediate response normally provided by a tutor or a group of fellow learners and so the text must itself should include a response. Usually, the correct answers along with a discussion of ‘why’ these are correct and what makes other answers wrong should be included. This is what makes classroom activities effective. The learner who is still uncertain can then be directed back to the relevant section of the text of the self-learning material.

Course Development

The second stage in the process of course preparation is called course development and refers to the actual writing of the course materials. The important aspects of this process are discussed as follows:

(i) Arranging the topics: The topics are to be arranged in a logical sequence in this, which should be based on the learner’s present knowledge of the subject. The initial sections should be of an elementary nature. From this initial point, the subject-matter should proceed step by step. Each step should take the learner a little further on and help him/her consolidate his/her learning through some activities before he/she goes to the next step. For all the topics, we should introduce it, followed by explanation and reinforcement.

(ii) Preparing the outlines of the unit: After arranging the topics in a logical sequence, outlines for individual units are to be prepared. Each unit is to planned and structured in a way that the learner experiences a minimal learning load with maximum learning.

(iii) Writing the text: The textual material of a study unit may be broadly divided into the following sections: opening section, the main body of the text and the ending of the unit.

(a) Opening section: The opening section of a unit should help the learner approach the content, preferably on the basis of his/her previous knowledge or skill. Thus this section should include the following:

- The title and the number of the lesson.
- The outline of the unit content presented as unit structure or simply as structure.
The statement on the unit objectives which can be expressed in different ways explaining what the learners are expected to do and learn.

An introduction which explains in brief the content of the units. The introduction should be attractive and encouraging and must make the learner feel that he/she can manage the rest of the unit. Along with motivation to the learner, the introduction should provide appropriate information and guidance with regard to the skills or knowledge a learner needs to have in order to comprehend the content properly and easily.

(b) Main text/body: The main text comprises the actual content of the unit and is based on learning activities. It refers to other sources of information available. The relevant references include text books, audio-video programmes, and earlier units and so on. While coming up with the actual text we should take into consideration, active learning, the language, style and illustrations.

(c) Ending: The end part of the unit should summarize all that has been discussed in the unit, and supply feedback on all the activities carried out. Thus, the learner is prompted to revise the important content in the text. Assignments are given out at the end of a unit.

Course Production

Course production is the last stage in the process of the preparation of materials. It includes the production of both audio-visual and printed materials. Audio-video production is also undertaken along with the production of print materials. The multi-media package thus prepared is sent to the learners to be used in their own time.

(a) Editing: Editing is one of the most important stages in the process of text production. The editor performs the following tasks:

- Ensures the soundness of the text, including the correctness of content.
- Prepares manuscripts for printing.

(b) Layout: Layout includes considering the following:

- The size and type of font to be used.
- The page size, the number of columns.
- The nature of margins, placement of pictures.

Meticulously ordered layout makes each page of the unit attractive and learner friendly. This also includes processes such as assigning art work to artists, typing the text, and proof reading.
(c) **Printing**: Printing is an industrial process. The institutional academic staff is usually not involved in it directly.

(d) **Despatch**: After printing the material, it is stored in the institute from where it is despatched to learners at the scheduled time.

**Text Preparation**

Distance teaching institutions depend on printed materials, so one of their main jobs is to prepare teaching materials in print. If the materials are not prepared and printed as per the schedule, the institutions will have operational and administrative problems. It is important that each person involved in the process is aware of his/her functions and responsibilities and is sensitive to the needs of other members of all the departments to be aware of the constraints within which course preparation takes place.

In some institutions, all the activities connected with course preparation are carried out within the institutions by their own staff. In others, some jobs are carried out by outsiders i.e., part-time or course writers while others are looked after by associated departments within the institutions.

There are six categories of people involved in course development and are as follows:

(a) The academic staff of the institution
(b) The course writers
(c) The media producers
(d) The editors
(e) Subject specialists from other institutions
(f) The learners

**Check Your Progress**

3. What are the two main forms of evaluation?
4. What are the tasks performed by editors?

### 9.4 RADIO

Globally open distance learning is recognized as an effective mode of supplement for the regular classroom instruction in formal education. More and more universities are offering distance education to learners. Teaching learning process in distance education system should maintain a good communication link between the source of teaching and the learner. For this, it needs a proper multimedia for effective communication with the distant learners. The selection, feasibility and use of different communication media determines the success of distance education institutions
Radio and Television

Radio can be considered as a medium of teaching as it consists of transmission through broadcasting of audio signals to listeners. The number of listeners of a radio broadcast may range from those within the radius of a few kilometers in the case of FM transmission to several millions in the case of national broadcasting. Educational broadcasts are a part of the programmes of several AIR stations. Largely, the radio broadcasts are for listening at the time it is broadcast. However, with the availability of storing devices the message can also be stored by concerned persons/institutions. These two possibilities make it necessary that a decision is taken before broadcasting whether the material is for direct hearing or to be recorded for later use. Another related question is whether the message is to be broadcast once or more than once and with what interval.

Radio and television broadcast are of particular importance in distance teaching as alternatives to face-to-face contact which is almost missing in it. Researchers have found that the use of radio in correspondence education is accompanied by increases in the percentage of written assignments submitted by the students of the Delhi University correspondence courses as compared to their counterparts without radio lesson facilities. There could be various programme formats for education broadcasts. It could be a lecture or radio talk by experts, interview/discussion involving a team, sound recording of complete text or excerpts of historic interest, or radio-vision consisting of talk to be accompanied by diagrams/pictures/slides. TV broadcasting is an important component in the open universities in other countries. With the acquisition of its production technology and falling prices, home-receiving sets of TV broadcast are available in large number of Indian households and the number is increasing day by day. The specific value of TV broadcast will vary according to the context in which it is used. But there is no doubt that it can provide distance learners with unique resource material.

Demonstration of complex or expensive experiments, field visits, microscopic observations, advanced technical equipments, industrial processes, social and interpersonal interaction and interviews with outstanding persons in a field are just some of the experiences that can be offered to students in their own homes through broadcast television. Generally, the broadcast television programmes have their strength in encouraging interpretations by individual learner, stimulating thinking, providing an overview or synthesis, demonstrating continuous processes and raising awareness and developing skills of evaluation.

At the same time they have their weakness in achieving mastery learning, giving feedback, and presentation of complex ideas and probably even development of abstract thinking. The TV programmes are short-lived, they cannot be reviewed, are presented at the same pace for all learners and do not provide scope for
reflecting on an idea or thought during a programme unless one loses the thread of the programme itself. However, it would be too early to talk of its effectiveness in certain terms since much needs to be explored in terms of its use in distance teaching.

Audio-Cassette/CD
Audio and the video-cassettes/CD are the media which would probably be crucial for the success of distance education. For students, study material presented on cassette offers considerable freedom. It can be used when it appears most relevant to the individual needs of students and at a time and place convenient to them.

   This is precisely the reason why it might be more appropriate for distance teaching. Moreover, the hardware, cassette-player provides the learner with a scope to stop, pause and replay the text according to the personal preferences of students. It has been argued in the past that cassettes provide students with a learning medium which shares many of the advantages inherent in a written text such as skimming, reviewing and control of pace while restoring the advantages of voice modulation.

Video-Cassette/CD
Video-cassette/CD is more recent and an evolving educational medium. Video-cassettes are like broadcast television in the sense that they combine moving pictures with sound. At the same time they are different in the sense that they can be viewed in ways which are independent of predetermined transmission time. Video-cassettes have the advantage of providing the student with increasing control over the medium.

   Their more flexible control characteristics allow students to adjust the pace of the material to their individual appropriate level by replaying sections that move too quickly or by skimming forward over sections that are too slow. Even though at present a majority of the distance learners do not have any access to video-cassette players, considering the fact that it is a high growth industry, it is expected that in about a decade or two its accessibility figures would be far more satisfactory.

Video-Disc
The video-disc technology is at present not available in India. A video-disc is a brilliant silver coloured disc is about 30 cm in diameter. Use of a laser-based photomechanical process makes it possible to produce a reflective surface which faithfully reproduces the audio-visual properties of the original programme material. From this master disc plastic copies can be relatively inexpensively produced by moulding or stamping processes similar to those used for producing gramophone records. One can think of a video-disc as a high fidelity gramophone disc with pictures to accompany the sound.
With the existing technology a video-disc can contain up to 55,500 individually numbered pictures or can play continuously for more than one hour. A beam of laser light is used to play the disc. It can be viewed on a standard TV set and hence has all the advantages of a video-cassette. However, there are two features of the video-disc player which makes it unique. One, since only a beam of light is striking the surface of a video-disc, the disc will last indefinitely. Two, the location on the disc from which the laser beam is receiving information can be changed rapidly and precisely, allowing precise rapid single picture access. In addition it provides slow motion forward and reverse and rapid scan forward and reverse. Most video-disc players are equipped with an input port to accept digital signals directly from a computer. This combination of computer/video-disc player is the basic interactive video-disc system. This system makes it possible to develop computer assisted learning materials that combine the logical control and flexibility of computer software with the audiovisual characteristics of a video-disc.

Considering the fact that the physical capabilities of the computer/video-disc system are much more than any of the educational lessons now available, its educational uses can only be speculated.

**Word-Processor**

If the technologies mentioned so far were mainly for the delivery of the educational programmes, a Word-processor is more for planning, designing and production of programmes. Considering the fact that the printed text has been and will continue to be for some time the basic medium for providing learning experiences in distance teaching, one can imagine the manpower, materials and energy being spent in production of texts. Word-Processors are like electronic typewriters with additional abilities for electronic as well as permanent external storage, computerized housekeeping and visual display of at least 20-30 lines of text. Since, the material is first stored in memory instead of direct typing on paper, many amendments in the text in terms of spacing, sequencing, deleting, right/left justification, and so on can be done before arriving at the final script to produce any number of copies through a printer unit.

These facilities are extremely helpful in preparing a distance teaching text which routinely undergoes several processes such as drafting, typing, redrafting, retyping, editing, illustrating, and printing. If such facilities are in one single machine, it helps in keeping the production of a course on schedule.

**Check Your Progress**

5. State any one disadvantage of television programmes as a medium of teaching.
6. What are the advantages of using a word-processor?
9.5 TELEVISION EDUCATIONAL SATELLITE

The application of space research technology has facilitated distance education in various ways. The communication satellite is a vital part of this technology. It is a spacecraft which receives signals from a transmitter on earth, amplifies the signals, changes the carrier frequencies, and then retransmits the amplified signals back to the receivers on earth. A satellite is launched into a geostationary orbit using either an unmanned vehicle or a piloted space shuttle that is reusable. The machine, popularly known as the Satellite Launch Vehicle (SLV), has one or more rocket stages that provide the acceleration needed to launch a satellite into the desired earth orbit. The satellite is normally placed in a circular earth orbit by the SLV and then transferred, shifted or fixed into a geostationary orbit. A special rocket in the satellite provides the acceleration needed to transfer the satellite from a circular orbit into a geostationary orbit. This special rocket in the satellite is called an ‘apogee motor’ or an Apogee Kick Motor (AKM).

The space shuttle provides an alternative method of launching communication satellites. Launching satellites with a space shuttle is less expensive than using unpiloted launch vehicles because a space shuttle can launch more than one satellite on a single mission and then it can be reused (Douglas, 1988). Once the satellite is fixed in the geostationary orbit, it rotates in the same direction as the earth, at a velocity that equals the rate at which the earth rotates. Communication satellites are usually placed in a special earth orbit, which makes them appear stationary to the transmitters and receivers on earth. There are more than a hundred of these communication satellites in orbit around the world, and new satellites are being launched regularly by different countries. The key to satellite-based communication is not simply the satellite itself. Other elements such as the ground-based transmission station known as uplink and a receiving disc known as downlink are important too. The uplink sends signals to the satellite, which amplifies and retransmits them back to the downlink, that is, the direct receiving disc, which in turn feeds a local station.

The USSR was the first nation to put space satellite SPUTNIK into the earth orbit in 1957. During 1960s, the USA too embarked on a space programme that covered various activities which resulted in Apollo Eleven-Man’s first Moon landing in 1969. During 1970s, efforts were made to make use of space research and its benefits to protect the quality of environment and improvement of life in general for all mankind. One of the first uses of space technology for mankind was to improve weather forecasting and international communications. Remote satellites have added a new dimension to the identification, evaluation and exploitation of natural resources. A new era has started with satellites and their application in various human activities. National and international television networks have revolutionized in recent years which enable to telecast live programmes all over the world. Space organizations in India deserve all praise for their launching of satellite
INSAT 1B in geostationary orbit has enabled the country to be integrated by a national TV network.

**Satellite Orbits**

One of the important factors making the communication satellite useful for specific purposes is the orbit into which the satellite has been fixed. There can be four types of orbits available for positioning satellites in space (Nicholson, 1976) and are discussed in the following section.

1. **Low orbit**: In the early stages of the development of satellite technology, the orbits were close to the earth’s surface (called ‘low’ in space technology). In the absence of sophisticated satellite launching equipment, the satellites could not be launched very far into space. Satellites in low orbits pass very rapidly from horizon to horizon and can be used for communication only for a short period. The speed of the revolution of the satellite in the low orbit and that of the earth does not match. Therefore, satellites in low orbits are not very useful for telecommunication purposes.

2. **Medium orbit**: As space science progressed, more powerful satellite launching vehicles (SLV) were designed and developed which made it possible to place the satellite in a higher orbit. Satellite orbits ranging from a few hundred to a few thousand kilometres above the earth’s surface is classified as the medium altitude orbits. Satellites in such orbits also revolve rapidly and we need to move earth station antennas to chase the satellite in space. In such cases, at least two antennas are installed, one antenna follows a setting satellite and the other follows a rising one.

3. **Geo-synchronous orbit**: At a distance of about 36,000 km from the earth’s surface, an orbiting satellite can move at such a speed that it appears to be stationary to the people on the earth. This orbit is known as a geo-synchronous or geo-stationary orbit. These days most of the new communication satellites, both for national and international use, operate in this orbit which is useful for communication purposes. Geo-synchronous orbit satellite systems offer advantages in cost and complexity as compared with the low and medium altitude systems.

   The main advantage of a geo-stationary orbit is that the earth station antennas do not have to track the satellite, but can instead be mounted in a fixed position. For a satellite to remain in geo-stationary orbit, it must satisfy the following conditions:
   - Angle of inclination must be zero (that is, a special orbit directly above the equator)
   - Satellite must move in the same direction as the earth’s rotation
   - Satellite completes a revolution in 23.94 hours to match the rate of earth’s rotation on its axis
Almost all communication satellites are geo-stationary, that is, their orbital period around the earth is 24 hours (23.94 hours to be exact, so they appear to occupy stationary positions in the sky from the earth. The Indian National Satellite series (INSA T) is also geo-synchronous satellites positioned in the space.

Due to the recent innovations in space technology, it is possible to use synchronous satellites, which are extremely powerful and large and capable of broadcasting directly to inexpensive antennas located on the roofs of individual homes. These satellites are not dependent on ground-based receiving and re-transmission equipment. Because of the absence of an intermediate agent in the reception of signals, this is a type of satellite that offers the chance of extensive use in the field of education, especially that of remote isolated populations. Besides providing regional and local coverage, it can distribute signals at the national level.

4. **Special orbit**: There are a number of useful specialized orbits in space for certain other services such as meteorology, remote sensing, natural resources, and so on. Among these is the medium altitude sun-synchronous polar orbit that provides coverage of the same areas of the earth’s surface twice a day.

**Educational Programmes through Space**

Man has continuously engaged throughout human history to educate and train his fellow beings in the pursuit of happiness and excellence. But constraints were always faced because of limitations. In the wake of radio communication during 1930s and availability of wireless sets to the common man in 1940s, the concept of distance education began to take shape. Lectures and special lessons were being broadcasted regularly for the benefit of schools and colleges.

With the advent of television and satellite communication, it has become possible to telecast live programmes all over the country through satellites such as INSA T 1B. A major utilization of this type of resource has been started by University Grants Commission (UGC) which has started telecasting special programmes of lectures for the benefit of viewers during the day. Some of the programmes have made good impression on the viewers.

However, it is essential that the programmes, their impact on the audience, feedback and audience selection, wide publicity, experts, participation and facility for televising in regional languages are given more importance and attention. Special channel utilization and interaction with various universities will have to be looked into. Special courses can be given through the mass media in some cases.

Satellites can be used simultaneously for radio, telephone, and television and data traffic. Incidentally, technologists in Canada have successfully received and transmitted three TV programmes using a single ANIK by transponder (a domestic communication satellite of Canada). It is in the experimental stage and
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... gives us an idea about the extraordinary capacity of the satellite (ACCESS, 1980-81). Multi-purpose satellites offer a wide variety of combinations. Besides serving communication purposes, the satellites are also used for remote sensing, as required in soil surveys, during floods (assessment of area under water, and so on), in forestry (tree resources, tree diseases, and so on), oceanography, and so on. As a satellite can provide more channels, it can offer more and better transmission time necessary for the distance teaching systems.

In the present technological society, a lot of media is available such as print, radio, audio, video, telephone, e-mail and internet providing unlimited opportunities of interaction and communication through computerization, tele-conferencing and satellite based communications. Commenting on the usefulness and desirability of the communication media and technology available at present, Ramanjam (2007) writes: ‘Computer technology and satellite communication have opened up a wide range of interactive media which enables the students to overcome the communication barriers imposed by the physical distance between the learner and the teacher/institution in the context of distance education. However, the questions related to availability, access and use of relevant technology for distance education need to be considered carefully, before institutions commit themselves to policies of technology and multimedia. It is also to be seen that whether institutions may have access to sophisticated technology, but the same is not the case student’s access. The students’ access to technology is still limited in our country’.

Internet in Distance Education

The Internet is the network of networks and defined as the world’s largest inter-network system that provides the fastest, easiest and cheapest means for the countless users to get and communicate information on a global basis. Two types of computer programme servers and clients help to operate the Internet. The servers are programmes that provide resources and the clients are programmes that the people use to access the resources. The Internet connection to the computer enables to avail benefits from it. A number of computer machines (hardware) operate the internet. These machines work as a server and the clients make use of specialized software exchange information between them. A set of rules observed by the software in the internet operation is called internet protocols. There exist various types of internet protocols viz., file transfer protocol and Hypertext Transfer Protocol. Files can be transferred from computer to computer by using file transfer mechanism. Uploading or downloading are the two terms used for sending or receiving the file. The Internet gives the users free access to a wide variety of files containing free software such as fonts, games and clipart, software that can be used free for a trial period, documents like research papers and articles, advertisement application forms of the institutions, information and rules of establishments and upgrades to current software. It is not always possible to access the files and some of the STD sites may ask for opening user account or ask for ID and then allow downloading files. Hypertext Transfer Protocol governs the transfer...
of hypertext between more computers. Accessing of information on the web is made possible through this powerful protocol. HTTP can make possible to access the World Wide Web. The user can select the hypertext link on the computer with internet connection, the computer makes use of HTTP to contact the server, identify a resource and ask the server to respond with an action. The computer accepts the request and then uses HTTP to respond to the action. The Internet provides the opportunity of getting information and communication among the users by making use of a variety of services such as the following:

- **Electronic Mail (E-mail):** Post Offices, Courier Sources or personal messages are the mode to send letters or documents in the conventional mode of mail. But we know that it takes time and money. The Internet solved this problem by e-mail service. Exchange of information and documents between people across the country or around the world is made possible through e-mail. In e-mail, the messages can be sent to the specified addresses at a time in the form of electronic messages travelling along the Internet. It made possible to interact quickly and easily with millions of people around the globe any time. Moreover, if one is not available to receive the communication, it may be safely stored in the mail box of the personal computer for being read and replied to at leisure. Chatting i.e., communicating with other people by typing messages on the keyboard and receiving their reply on the screen and at the same time be able to see and talk to each other has also become possible through the Internet.

- **World Wide Web:** The Internet offers a fast growing valuable service known as World Wide Web (www) to the users. A large system of servers offers all kinds of information to anyone on the Net. The information can be in the form of text, pictures, sounds or other types of data. All types of information in vast amount are available at the websites maintained by organizations or individuals in the form of web pages. Web browser enables the user to get access to this information. A single unit of information often called ‘document’ is available through www is known as web page.

The distance education institutions may put web pages by creating its website containing information about its men-material resources, the courses it offers, admission procedures, type of coaching it provides, the achievements of the past, present and future of the institution. Thus, it helps the students to apply and register for course and complete course work electronically through its website.

Information on various subjects is available on the web pages. Web browser helps the distance education students to get access and download the information from the Internet. This is known as internet browsing. Surfing is a process of browsing without tools. Starting with a particular web page and following the links from page to page making intelligent guesses to have access to the desired information is known as surfing. Now, the developed web technology has made it possible to use search engines for searching the desired information. Ex: Google,
Yahoo. A search engine contains useful databases containing references to a host of information resources.

**Check Your Progress**

7. Define the term, ‘surfing’.
8. What is the main advantage of a geo-stationary orbit?

### 9.6 SATELLITE INSTRUCTIONAL TELEVISION EXPERIMENT (SITE)

The Satellite Instructional Television Experiment (SITE) was launched in the country in August 1975 for a period of one year. Under this experiment, it was possible to televise programmes to 2,400 villages in six states, viz., Andhra Pradesh, Bihar, Karnataka, Madhya Pradesh, Odisha and Rajasthan. The in-service teachers’ training programme, which was organized in 1975, was repeated in June 1976 to train 23,090 teachers for teaching science.

The communication satellite ATS-6 was made available to India for this programme for a period of one year from August 1975 to July 1976 on the basis of the Memorandum of Understanding signed by India and NASA (USA).

The major objective of the SITE programmes was to help people in their development endeavours. As children’s morning programme formed an important component of the SITE, educational advancement was emphasized more than anything else.

After the success of SITE in 1975-76, India decided to have a multi-purpose national satellite of her own. The Indian National Satellite System (INSAT-1) represents India’s first step in this direction.

INSAT-1 is a multipurpose satellite. It is intended for telecommunication, weather forecasting and other meteorological observations, data transmission, direct TV broadcasts to direct receiving sets in rural communities, networking of terrestrial TV transmitters, and regional and national networking of radio transmitters.

According to a recent plan of the Department of Education, Ministry of Human Resource Development, Government of India, the major educational objectives of INSAT television programmes is to promote alternative approaches to education for children, youth and adults. There are specific programmes to emphasize direct teaching that aim to reduce the work load in classrooms and improve the quality of programmes through training of manpower.

Besides education, INSAT broadcasts are devoted to economic development. These cover general economic well-being, social change, improvement in agriculture and irrigation and, above all, national integration, communal harmony and secularism.
The University Grants Commission (UGC) has harnessed INSAT for a programme of enrichment of students engaged in higher studies.

**Centrally Sponsored Scheme of Educational Technology**

In 1982, with the commissioning of INSAT transmission, it was decided that production of ETV programmes will be the responsibility of educational authorities. Accordingly, a scheme was prepared by the Ministry of Education for creating Educational Television (ETV) programme production facilities within the education sector on a decentralized basis by setting up a Central Institute of Educational Technology (CIET) under the aegis of NCERT and State Institutes of Educational Technology (SIETs) in six states, viz., Andhra Pradesh, Bihar, Gujarat, Maharashtra, Uttar Pradesh and Odisha, besides strengthening of ET cells in other states.

### Check Your Progress

9. What was the main objective of the SITE programmes?

10. Why is INSAT-1 considered as a multipurpose satellite?

### 9.7 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. One of the important features of distance education system is its ability to reap economies of scale. The learning packages of the system can be used for an unlimited number of students that too for a reasonably long period of time.

2. Flexibility is an important aspect of the distance education system so that it can be dynamic in nature. This flexibility is as much a function of its structure as its methods. A forward-looking distance education system would provide for a modular structure for its programmes with multiple points of entry and exit so that a potential learner can choose a module or a number of modules which will best satisfy his/her perceived needs with provision for moving on to the next module(s) as and when he/she feels the need to do so.

3. The two main forms of evaluation are as follows:

   **(a) Assessment of courses by learners themselves:** A brief questionnaire seeking information regarding the quality of the study units may be sent along with the materials, and the students are asked to respond. The responses received should provide an idea of the strengths and weaknesses of the materials from the viewpoint of the students. Improvement should be the motive of this assessment.
b) Assessment of courses by second person (tutor, trainer or counsellor): It is extremely important to evaluate courses and judge how far they are meeting the educational needs which were identified in the beginning of the planning. It should be possible to design worksheets on a course so that the tutors may provide some information about its effectiveness.

4. The editors perform the following tasks:
   (a) Ensures the soundness of the text, including the correctness of content.
   (b) Prepares manuscripts for printing.

5. One of the main disadvantages of television Programme as a medium of teaching is that the TV programmes are short-lived. They cannot be reviewed, are presented at the same pace for all learners and do not provide scope for reflecting on an idea or thought during a programme unless one loose the thread of the programme itself.

6. The following are the advantages of using word-processors:
   (a) The material is first stored in memory instead of direct typing on paper, many amendments in the text in terms of spacing, sequencing, deleting, right/left justification, and so on can be done before arriving at the final script to produce any number of copies through a printer unit.
   (b) These facilities are extremely helpful in preparing a distance teaching text which routinely undergoes several processes such as drafting, typing, redrafting, retyping, editing, illustrating, and printing.
   (c) If such facilities are in one single machine, it helps in keeping the production of a course on schedule.

7. Surfing is a process of browsing without tools. Starting with a particular web page and following the links from page to page making intelligent guesses to have access to the desired information is known as surfing.

8. The main advantage of a geo-stationary orbit is that the earth station antennas do not have to track the satellite, but can instead be mounted in a fixed position.

9. The major objective of the SITE programmes was to help people in their development endeavours. As children’s morning programme formed an important component of the SITE, educational advancement was emphasized more than anything else.

10. INSAT-1 is a multipurpose satellite as it is intended for telecommunication, weather forecasting and other meteorological observations, data transmission, direct TV broadcasts to direct receiving sets in rural communities, networking of terrestrial TV transmitters, and regional and national networking of radio transmitters.
9.8 SUMMARY

- In today’s time, distance education is one of the most rapidly growing areas in education and training. The pace of growth of distance education has been greatly influenced by developments in communication and information technologies and these have accelerated significantly.

- Vocational education and training can also get support from distance education. A major contribution made by distance education for many years in several developing countries is in the area of training unqualified or under-qualified teachers.

- For being dynamic, a distance education system needs to be flexible. This flexibility is as much a function of its structure as its methods.

- The learners’ locations and environments are important considerations in designing the delivery systems as far as the distance education management is concerned.

- A unique feature of distance education system is its ability to reap economies of scale. The learning packages of the system can be used for an unlimited number of students that too for a reasonably long period of time.

- Computer-based interactive interaction through Local Area Networks (LAN) and Wide Area Networks (WAN) as well as the Internet has added a new dimension to the previously available distance education technology.

- Most distance education institutions today use Desktop Publishing (DTP) techniques for their course development and production; depending upon the size of enrollment, it resorts to ‘just-in-time’ production methods for low enrollment programmes and bulk production and warehousing for high enrollment programmes.

- Learning through self-learning texts is different from any other kind of teaching. The kind of writing required for such materials is quite different from that used in writing a lecture or an article for a journal.

- It is very important to plan the writing of a course carefully and well in advance. In face-to-face teaching, it is easy to make on the spot adjustments in teaching strategies which will suit the needs of different groups of learners which is not possible in distance teaching.

- The second stage in the process of course preparation is called course development and refers to the actual writing of the course materials.

- Course production is the last stage in the process of the preparation of materials. It includes the production of both audio-visual and printed materials. Audio-video production is also undertaken along with the production of print materials.
Distance teaching institutions depend on printed materials, so one of their main jobs is to prepare teaching materials in print. If the materials are not prepared and printed as per the schedule, the institutions will have operational and administrative problems.

Globally open distance learning is recognized as an effective mode of supplement for the regular classroom instruction in formal education. More and more universities are offering distance education to learners.

Radio can be considered as a medium of teaching as it consists of transmission through broadcasting of audio signals to listeners.

Radio and television broadcast are of particular importance in distance teaching as alternatives to face-to-face contact which is almost missing in it.

Audio and the video-cassettes/CD are the media which would probably be crucial for the success of distance education. For students, study material presented on cassette offers considerable freedom.

Video-cassette/CD is more recent and an evolving educational medium. Video-cassettes are like broadcast television in the sense that they combine moving pictures with sound.

If the technologies mentioned so far were mainly for the delivery of the educational programmes, a word processor is more for planning, designing and production of programmes.

The application of space research technology has facilitated distance education in various ways. The communication satellite is a vital part of this technology.

One of the important factors making the communication satellite useful for specific purposes is the orbit into which the satellite has been fixed.

Satellites can be used simultaneously for radio, telephone, and television and data traffic. Incidentally, technologists in Canada have successfully received and transmitted three TV programmes using a single ANIK by transponder.

The Internet is the network of networks and defined as the world’s largest inter-network system that provides the fastest, easiest and cheapest means for the countless users to get and communicate information on a global basis.

The distance education institutions may put web pages by creating its website containing information about its men-material resources, the courses it offers, admission procedures, type of coaching it provides, the achievements of the past, present and future of the institution.

Surfing is a process of browsing without tools. Starting with a particular web page and following the links from page to page making intelligent guesses to have access to the desired information is known as surfing.
The major objective of the SITE programmes was to help people in their development endeavours. As children’s morning programme formed an important component of the SITE, educational advancement was emphasized more than anything else.

INSAT-1 is a multipurpose satellite. It is intended for telecommunication, weather forecasting and other meteorological observations, data transmission, direct TV broadcasts to direct receiving sets in rural communities, networking of terrestrial TV transmitters, and regional and national networking of radio transmitters.

9.9 KEY WORDS

- **Apogee Kick Motor (AKM)**: It refers to a special rocket in the satellite which provides the acceleration needed to transfer the satellite from a circular orbit into a geostationary orbit.
- **Desktop publishing**: It refers to a form of publishing in which the documents are created by using page layout software on a personal computer.
- **Distance education**: It refers to a form of mediated teaching and learning in which the learner and the teacher are separated by time and space.
- **The Internet**: It refers to the largest inter-network system that provides the fastest, easiest and cheapest means for the countless users to get and communicate information on a global basis.

9.10 SELF ASSESSMENT QUESTIONS AND EXERCISES

**Short Answer Questions**

1. Write a short note on the contribution of distance education in the contemporary times.
2. Why is it important that distance education system should be dynamic in nature?
3. What is Desktop Publishing (DTP)?
4. What are the important aspects of course development?
5. Write a short note on the importance of radio as a medium of instruction in distance learning.
6. What are the types of orbits available for positioning satellites?
Long Answer Questions

1. Discuss the importance of distance education in the existing times.
2. Vocational education and training can also get support from distance education. Elucidate the statement.
3. Explain the considerations to be taken by managers while deciding the choice of media for distance learning.
4. Identify the stages involved in the course planning of distance education courses.
5. Describe the major educational objectives of INSAT-1.

9.11 FURTHER READINGS


UNIT 10 TEACHING

Structure

10.0 Introduction
10.1 Objectives
10.2 Difference between Teaching and Instruction
10.3 Teaching at Different Levels
  10.3.1 Memory
  10.3.2 Classification of Memory
  10.3.3 Memory Level of Teaching
  10.3.4 Model of Memory Level of Teaching
  10.3.5 Understanding
  10.3.6 Reflective
  10.3.7 Model of Reflective Level of Teaching
10.4 Modification of Teaching Behaviour
  10.4.1 Microteaching
  10.4.2 Simulation
10.5 Answers to Check Your Progress Questions
10.6 Summary
10.7 Key Words
10.8 Self Assessment Questions and Exercises
10.9 Further Readings

10.0 INTRODUCTION

A teacher can present content at three basic levels which are memory level, understanding level and reflective level.

According to renowned author, Ned A. Flanders, the author of the book, Analyzing Teaching Behaviour, teaching is interactive in nature. When teachers and students interact, they participate in the process of teaching. In this process, students are influenced by the teacher. Students also interact among themselves. Thus, the process of teaching is wherever person interacts with every other person in a class.

It is important that the process of teaching should not be confused with training, instruction and indoctrination. However, all these may help in the process of teaching. Teaching is more complex, wide and comprehensive in comparison to all these terms.

In this unit, the difference between teaching, instruction and indoctrination is highlighted. The process of teaching at various levels has been discussed in detail. The unit will also provide an in-depth knowledge about the two main teaching methods which are microteaching and simulation along with their advantages and disadvantages.
10.1 OBJECTIVES

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

- Analyse the difference between teaching, instruction and indoctrination
- Explain the three main teaching levels
- Discuss the phases, classification and model of memory teaching
- Identify the steps involved in the understanding level of teaching
- Interpret the model and characteristics of reflective level of teaching
- Discuss the methods related to modification of teaching behaviour

10.2 DIFFERENCE BETWEEN TEACHING AND INSTRUCTION

Let us look at some of the definitions of teaching by experts in the field.

According to American philosopher of science and of education Israel Scheffler, ‘teaching may be characterized as an activity aimed at the achievement of learning and practiced in such a manner as to respect the student’s intellectual integrity and capacity for independent judgement.’

Educational technologist and theorist, B.O. Smith (1960) defines teaching as ‘a system of actions intended to induce learning.’

In Scheffler’s definition, the activities focused on learning have been termed as ‘teaching’ whether these activities produce learning or not. In Smith’s definition, propagandizing and indoctrination of these principles are included which produce learning. Hence, Smith’s definition is more comprehensive than Scheffler’s even though both the definitions are learning-oriented.

Thomas F. Green, an American educational theorist (1971) has given very comprehensive definition of teaching, i.e., ‘teaching is the task of teacher which is performed for the development of a child.’

According to another renowned theorist, Clark (1970), ‘teaching refers to activities that are designed and performed to produce change in student behaviour.’

Teaching is not a single activity. It can be interpreted in its molecular form. It can be viewed as a family of activities. In this family of activities, every activity becomes important.

Teaching/Conditioning and Training

Usually, the meaning of teaching is expressed in the form of habit formation while training is interpreted as shaping habits. Both these concepts are closely related. However, teaching and training are not alike. Training is the part of teaching. The more the intelligence exhibited in the training programme, more it would be closer
to the teaching-process and would resemble with teaching. Actually training resembles more with conditioning than teaching. In short, the main difference between training/conditioning and teaching is reflected by the quantity of intelligence used. In the process of training and conditioning, the acquisition of new turn to the human behaviour and the acquisition of various skills are helped. Hence, the training and conditioning can produce skilled workers. Persons cannot be promoted to the next higher level of education as a result of training.

Teaching and Instruction

Instruction is also one of the activities related to teaching. Sometimes, we term instruction as teaching. However, instruction and teaching are not the same. There are many examples which convey us that the instruction and teaching are different though they are related to each other. A perfect example is — when an activity to teach a dog to stand on its feet or to sit down or to bring some object starts, it would be wrong to term it as ‘providing instruction’ or ‘providing guidance’. Whenever we happen to provide instruction or guidance, it means we are performing the task of teaching. But when we teach, it is not necessary that instruction too is included in that teaching.

Under instruction or guidance, causes are explained, evidences are supplied. In short, instruction or guidance is concerned with understanding. In training, more attention is paid towards habit formation and behaviour development, and less towards the acquisition of knowledge. Hence, the instruction activity is only a small part of the comprehensive concept of teaching. Instructions cannot reach to the high level of teaching. Teaching includes the presence of a teacher, participation of the students and their activism, while these are not essential in instruction. Instruction is possible through radio, tape-recorder and television. In the teaching process, such type of hardware material related to the instruction can be used. Hence, all the activities related to the instruction can be included in the teaching process, but inclusion of entire or total teaching is not possible in the instruction.

Teaching and Indoctrination

Indoctrination is the highest level of teaching. At this level, more intelligence is expected. All the great men, politicians and leaders influence other people with the support of their ideology, thoughts, assumptions and beliefs. The teacher can include indoctrination in his or her teaching process. It means it can be made a part of the teaching by including indoctrination in the teaching but it is not enough.

On the other side, it should also be made clear that teaching can also occur without indoctrination. However, without teaching process (teaching means, teaching objectives) indoctrination is not possible.

Thus, one can say that conditioning, training, instruction and indoctrination are part of the entire teaching process and they depict the various level of teaching process.
Check Your Progress
1. How has Israel Scheffler defined teaching?
2. What is the main difference between instruction and teaching?

10.3 TEACHING AT DIFFERENT LEVELS

Teaching is a purposeful process which has close relationship with learning. Therefore, in the modern age, teaching and learning, both, are accepted as one concept. We should remember that each type of content has its own nature and various teaching objectives. It is to be observed that a teacher can present the content at three levels, from thoughtless to thoughtful situations. These levels are—(i) Memory level (ii) Understanding level and (iii) Reflective level.

- Memory level teaching is ‘thoughtless’; it is the initial stage of teaching.
- Understanding level of teaching is the next higher level of memory level teaching. This level includes both memory and insight of the learner. In other words, for understanding level of teaching, memory level teaching is the pre-requisite.
- The third and the last level of teaching is reflective level. This level includes both memory and understanding levels of teaching. In other words, for reflective level of teaching, the occurrence of teaching both at memory and understanding levels is essential. In this way, the process of teaching starts from memory level which advances to reflective level after passing through understanding level of teaching. Remember that if the reality of the subject along with its knowledge is to be provided, the content must be taught at all the three levels. It depends upon the teacher’s competency that to what extent he succeeds in reaching up to reflective level starting from memory level on the basis of his efficiency and experiences. It is a common observation that the normal teaching corresponds to the memory level teaching. Such learned and efficient teachers who succeed in upgrading their teaching from memory level to reflective level teaching are needed.

We will discuss these levels in brief in the following section.

10.3.1 Memory

Memory is a mental process which occurs essentially in some quantity in every living being. When a person sees an object, a thing or a place, then the engrams of the object, the thing or the place are formed in his mind. To memorize these engrams or pre-learnt things is called memory. In other words, when we see any object, then the experiences of the object go on accumulating in our unconscious mind. When we recall these accumulated past experiences and we recognize them by bringing them into our conscious mind, then that is called memory.
Definitions of Memory

Let us look at the definitions of memory given by renowned educational theorists.

McDougall: ‘Memory implies imagining of events as experienced in the past and recognizing then to one’s own past experience.’

J.S. Ross: ‘A memory is a new experience determined by the dispositions laid down by a previous experience, the relation between the two being clearly apprehended.’

Stout: ‘Memory is the ideal revival in which the objects or past experience reinstate as far as possible in the order and manner of the original occurrence.’

Woodworth: ‘Memory is the direct use of what is learned.’

Phases of Memory

The following are the phases of memory:

1. Learning: Memory depends upon the engrams of experiences. Hence, the first phase of memory is the learning of some facts. Learning task is done by the conscious mind. In this phase, the life-experiences get engrammed in the brain in the form of mental impressions and these can be made conscious as and when needed. Hence, the pupils should not try to cram the contents while learning something, some subject or a place. They should acquire direct knowledge. Repeat it again and again. They should search out the meaning of that knowledge. Memorize that knowledge by linking it with other objects or subjects.

2. Retention: The process of making the contents permanent in the minds is called retention. Remember that the retention power occurs differently in different individuals. A person’s memory is said to be good if he can retain a matter or an experience in his mind for a longer duration. The pupils and adolescents have more retention power as compared to the adults. It is for this reason that they memorize rapidly. According to psychologists, the retention power reaches at its peak at the age of 25 years and after this it starts reducing. The retention power depends mainly upon four conditions namely; (i) brain (ii) health (iii) interest and (iv) thinking.

Every experience leaves an impression in the brain. Our brain not only protects these impressions, but also arranges them in a sequence. These sequenced impressions influence the person at every step of his life. Retention power is also closely related to the structure of the brain. Due to the differences in the structure of the brain of every person, variations in the retention power occur. As the result, some persons can make impressions stabilized in their brains for a longer duration, while some can for a comparatively shorter duration.

Physical health is also deeply related to the retention power. Our nervous tissues function very conveniently when a person is in good health. Therefore,
we learn anything very easily and quickly. This is one of the reasons that in the morning, when we feel fresh and energized, we learn things very fast. Contrary to this, when we are fatigued or stressed or in an unhealthy condition, we cannot remember or memorize something easily even if we try hard. The reason is that our nervous tissues don’t work properly when we are in unhealthy condition. Thus, our retention power lowers down.

Retention power is also related to ‘interest’ and ‘thinking’. We remember rapidly when we have interest in something. As we are interested in that particular matter, we think about it again and again. Then, we develop a relationship with it. Thus, we learn or memorize about the matter rapidly.

3. Recall: The learnt matter when brought to conscious mind is called recall. Recalling of past experiences is responsible for a person’s good or bad memory. If he fails to recall an experience or a matter when needed then all his learning goes in vain. Remember that those things which are not retained by proper methods, one faces difficulties while recalling them. When a person fails to recall the retained material that enhances the chances of forgetting. Psychologists have emphasized on certain laws in order to bring learnt material at the conscious level. These laws are Law of Contiguity, Law of Similarity, Law of Contrast, Law of Continuity of Interest, Law of Primacy, Law of Recency, Law of Frequency and Law of Vividness.

4. Recognition: If we see an object or a person and can remember that we have seen the person or the object, it is termed as recognition. Remember that the recall and recognition have the similar relationship as that of brain and the body. Recalling becomes difficult when the association among objects does not occur and consequently we are unable to remember them. Contrary to this, we recognize them quickly when our association among those objects and persons becomes strong. It is our experience that we recognize people very conveniently which we meet daily and the objects which we see in our daily life. Such recognition is called the definite recognition. When we recognize an object or a person partially and we are unable to tell definitely about the person, then such type of recognition is termed as partial or indefinite recognition.

10.3.2 Classification of Memory

Persons differ in ability to memorize. Some persons do not forget what they read after a single reading. Contrary to this, some people forget frequently even after reading something repeatedly. On the basis of their different abilities, memory can be classified as follows. In other words, memory is of the following types:

(i) Immediate memory: Immediate memory is that memory when a person recalls immediately after learning something. This type of memory has the following two characteristics – (a) It is temporary. It is possible that the learnt material may not retain for a longer period. (b) Its development occurs along with age. During infancy period, the development of the pupil is slow
and somewhat faster during childhood. During adolescence, this rate of development acquires its maximum limits.

(ii) **Permanent memory**: When a person is able to remember a learnt material for a long time, it is known as permanent memory. People, objects or places with which our association is strong are remembered for a longer duration.

(iii) **Personal memory**: While recalling past experiences, we remember our personal past experiences. This memory is called personal memory. During the period of acquiring education, every pupil gains his different experiences regarding his school, teachers and classmates. In future, when we recall everything out of those experiences, we also get recalled some related personal experience.

(iv) **Impersonal memory**: The recalling of the material learnt from the books and companions is called impersonal memory. There is no place of personal experiences in such types of memories.

(v) **Active memory**: The recalling of past experiences needs some efforts, for example the candidates sitting in examination hall have to make efforts to recall the answers to the questions again and again.

(vi) **Passive memory**: In passive memory, we recall the past experiences without any effort.

(vii) **Mechanical memory**: Mechanical memory is also known as physical memory. When our body becomes habitual of doing any task repeatedly, then our body has no need to recall that task again and again. For example, a swimmer swims without any major recalling.

(viii) **Rote memory**: Rote memory is the kind of memory in which the facts are crammed without any understanding. Such type of memory is very sharp during childhood. It is the reason that counting and tables etc. are crammed very rapidly. However the memory is not considered as very good memory.

(ix) **Logical memory**: To learn something by using intellect and its recalling when needed is called logical memory. Theorist, Burgson has termed this memory as true memory.

**Characteristics of Good Memory**

The following are the characteristics of good memory:

(i) **Rapidity in learning**: The first characteristic of good memory is its rapidity and simplicity in learning. Hence, the memory of a person can be called good if the person learns rapidly. Contrary to this, if a person learns slowly, his memory cannot be called good.

(ii) **Stability of retention**: Another characteristic of good memory is retention of learnt material for a longer duration. The pupils are said to have a good memory if they retain what they have learnt for a longer time. Its reverse i.e. the pupils who cannot retain for a longer time are said to have bad memory.
(iii) **Rapidity in recall:** In addition to rapid learning and stability of retention, the third characteristic of good memory is rapidity in recall. Those pupils are said to have good memory that can bring anything to their conscious level very rapidly. Only those pupils are said to have good memory who can recall anything according to the needs and at proper time.

(iv) **Serviceableness:** The fourth characteristic of good memory is its score ability at some occasion. There are some pupils who possess much but when needed, they remember only irrelevant material. Contrary to this, there are pupils who can recall the appropriate material or they can identify experiences and talents according to the need.

(v) **Forgetting irrelevant things:** A good memory requires forgetting of irrelevant things. The recalling of irrelevant things at the time of examination does not benefit the pupils. Similarly recalling the painful events of life does not prove to be beneficial in any way.

10.3.3 **Memory Level of Teaching**

Light has been shed on the meaning of memory, its various stages, types and characteristics in the above-mentioned description. Now, it is time to classify what memory level of teaching is. Remember that the memory level teaching is thoughtless. In this level of teaching, emphasis is laid on the presentation of facts and information. In other words, only cramming of contents is emphasized by the activities of memory level teaching. It is a matter of observation that cramming of facts of the contents has no relation with intelligence. The reason is that mentally handicapped children can also cram. Yes, it is something else that if the content is purposeful, then it can be crammed very conveniently and also can be retained for a longer duration. Hence, memory level teaching lacks insight. Almost all the pupils cram the contents unwillingly. They succeed in the school examination on the basis of scores secured by cramming but they seem to fail in the examination of the life.

In short, memory level is the level of cramming. In the teaching of this level, the facts and the information of the cognitive level are forcibly supplied to the brains of the pupils externally. Pupils recall and recognize this forcibly-retained knowledge when needed.

In reality, there is a definite pattern of memory level teaching. In this type of teaching, the teacher is like a dictator who suppresses the independence, interests, attitudes and competencies of the pupils and tries to impose the facts and information upon the pupils. Hence, in this level of teaching, the teacher remains active but the pupils go on learning by heart in strict discipline the facts and information as a passive listener. In short, no inter-action goes on occurring mechanically.

In the memory level teaching, signal learning, chain learning and stimulus-response learning are emphasized. In the end, both essay type and objective type
examinations are used to evaluate the learnt contents. The mentioned description shows that the memory level teaching is teacher centered. Pupils have secondary place in this level of teaching. As a result, the teacher goes on imposing facts and information externally by keeping them in the strict discipline in order to develop the pupils mentally, neglecting their interests, attitudes, abilities and needs. This makes the pupils ‘crammers’ but they can never become intelligent and learned person. The reason is that there is no interaction between the pupils and the teacher in the memory level teaching. In short, the teaching of this level is restricted to the cognitive level which is like a burden upon pupils. The teaching of this level has the maximum level of motivation.

The evaluation of the acquired knowledge is done by traditional methods. In spite of many drawbacks, the memory level of teaching has some importance. The reason is that teaching at understanding and reflective levels can be successful only when the teaching at memory level occurs. In other words, understanding and reflective level teaching cannot take place unless and until memory level teaching has not been managed. In this way, we can say, in the understanding and reflective level teachings, memory level teaching is included and it acts as a supplement.

If we observe carefully, while teaching subjects, like Sanskrit, Grammar and History, memory level teaching is successful and impressive. The teacher has no other alternative. Still, the present educationists are trying to avoid emphasis on cramming, but the pupil should be introduced with the basic concepts of the contents. Therefore, new mathematics has been developed in this modern age in which knowing the concepts is more emphasized instead of cramming. But the desirable results have not been achieved in this regard.

10.3.4 Model of Memory Level of Teaching

Johann Friedrich Herbart, a German philosopher and psychologist is the exponent of memory level teaching. He has described the following steps while presenting the model of memory level teaching:

Levels of Teaching

We will in the following section discuss the levels of memory teaching.

1. **Focus**: According to Herbart, the focus of memory level teaching is the emphasis on cramming of facts and development of the following capacities:

   (i) Training of mental aspects
   (ii) Providing knowledge of facts
   (iii) Retaining the learnt facts
   (iv) Recalling and re-presenting the learnt facts
2. **Syntax:** Herbart has divided the memory level-teaching into five steps which are known as Herbart’s Five Formal Steps. By following these five steps a teacher can create learning situations for memory level teaching. The following is the sequence of Herbart’s five steps:

- (i) (a) Preparation
  - (b) Statement of Aim
- (ii) Presentation
- (iii) Comparison of Association
- (iv) Generalization
- (v) Application

**Suggestions for Memory Level of Teaching**

Memory level teaching proves to be beneficial as it provides basic foundation for understanding level and reflective level teaching. The two levels cannot be successful without the memory level teaching. Hence, the following suggestions are followed by educational professionals to make the memory-level teaching effective:

- The teacher should try to achieve the cognitive objective.
- The content to be presented should be purposeful.
- The teaching points should be presented as a whole or in to.
- The content should be presented in a sequence.
- There should be no teaching when the pupils are tried.
- Only whole method should be used.
- A definite reinforcement system should be used.
- Recapitulation should be done in a rhythm.

**10.3.5 Understanding**

Memory level teaching is a pre-requisition for understanding level teaching. It is a figment of imagination to have results without this level. Remember that in the understanding level of teaching, the teacher tries to present his instructions in a way that students could understand properly. If a teacher succeeds in this attempt, then the competency to recognize, the teaching thoughtful. In other words, in understanding-level teaching, the teacher tries to provide more and more opportunities to develop the intellectual behaviours of the pupils. This develops the essential competencies for generalizations, insight and solving the problems. In this way, both pupils and the teachers participate in developing the lesson while teaching occurs at the understanding level.
Model of Understanding Level of Teaching

The model of understanding level teaching was indoctrinated by professor, H.C. Morrison. Hence, it is named as Morrison’s Teaching Model. Morrison has described the structure of this model in the following four steps:

1. **Focus:** According to Morrison, the focus or objective of the understanding level teaching model is that the pupil should achieve the mastery of the concept. In other words, the teacher stresses upon the mastery of the content so that a desirable change may occur in the personality of the pupils.

2. **Syntax:** Morrison has divided the syntax of understanding level teaching into five steps and a teacher can create teaching and learning situations following them. The orders of five steps of this model are as follows: exploration, presentation, assimilation, organization and recitation.

3. **Social system:** In the understanding level of teaching the various steps of social system go on changing. In presentation, the teacher controls the behaviour of the pupils like memory level by keeping himself more active and also he provides necessary motivation. In assimilation-period, both pupils and the teacher remain active. The teacher imparts necessary instructions to the pupils they work themselves with full involvement. Hence, in the understanding level teaching both extrinsic as well as intrinsic motivation is used.

4. **Support system:** In understanding-level teaching, the support system does not remain static, but it goes on changing. The pupils have to pass the examination of presentation in order to perform experiment in assimilation. Similarly, they have to pass assimilation test essentially for their entry into organization and recitation. At the end of organization period, a written test takes place. Similarly, recitation is followed by an oral test. Hence, both oral and written test (essay type and objective type) occur during the various steps of understanding level of teaching.

Limitations of Understanding Level Model

The limitations of understanding-level model, as given by Morrison, are as follows:

- It stresses upon the mastery of the content. Hence, human behaviour is overlooked.
- It does not help in developing affective and psychomotor aspects.

Suggestions for Understanding Level of Teaching

Morrison has provided the following suggestions to make the understanding level of teaching more effective:

- The pupil should not be allowed to enter the understanding level of teaching unless and until they clear the tests of memory level teaching.
• Every step of understanding level of teaching should be followed in a proper sequence.
• The pupils should be promoted to the new step unless they clear the tests of previous stage. For example, pupils should be allowed to enter assimilation only when they clear the tests of presentation.
• The teacher should provide psychological motivation from time to time in spite of his involvement in the content. Also he should raise the aspiration level of the pupils.
• The teacher should make efforts for solving the problems related to understanding-level of teaching.

10.3.6 Reflective
Reflective level of teaching includes both understanding and memory-level teaching. Reflective level of teaching does not succeed if the teaching of memory and understanding levels has not taken place earlier. Hence, the management of teaching at memory and understanding levels must have taken place before reflective level teaching starts. Remember that the reflective level teaching means ‘Problem-centered’ teaching. In this, the class-room environment is open sufficiently. The teacher creates such a problem before the pupils which arouses so much mental tension in the pupils that they start solving their problems by formulating and testing their hypotheses as a result of their own motivation and activeness. At last, a time comes when the problem is solved. In short, the teaching of reflective level cooperates in developing creative capacities by providing pupils with the opportunities of developing intellectual behaviour.

The real situation is that the human life is struggle. He has to do his best for achieving his aims of life. Sometimes, the achievement of the aims occurs, without any obstruction, in a natural way. But sometime human beings have to face numerous obstacles in order to achieve his aims. From this point of view, the provision of the teaching of reflective level is essential for the pupils. It is this teaching level which develops the reflective power of the pupils. As this power develops when they grow up, they can solve their problems of life by reasoning, logic and imagination and they can lead a successful and happy life. In short, the pupil learns to develop his original attitude as a result of his deep and serious study in order to solve his problem. This enables him to solve his future life problems successfully through reasoning, logic and imagination. Theorist, M.L. Bigge has rightly written about reflective level of teaching while clarifying it; he opines that reflective level of teaching tends to develop the class-room atmosphere which is more alive and exciting, more critical and penetrating and more open to fresh and original thinking. Furthermore, the type of enquiry pursued by a reflective class tends to be more rigorous and work producing than pursued at an understanding learning situation.
10.3.7 Model of Reflective Level of Teaching

The credit goes to Hunt for developing reflective level of teaching. Therefore, this teaching model is named as Hunt’s Model of Teaching. Hunt has described the structure of reflective level model in the following steps:

1. **Focus**: The reflective level of teaching has the following three objectives:
   - (i) To develop problem-solving competency among the pupils.
   - (ii) To develop critical and constructive thinking among pupils.
   - (iii) To develop independent and original thinking power among the pupils.

2. **Syntax**: The syntax of reflective level teaching is designed in the following four steps:
   - (i) The teacher creates a problematic situation before the pupils.
   - (ii) In the second step, the pupils formulate hypotheses for testing. Remember that more than one hypothesis may be formulated for the solution of a problem.
   - (iii) In the third step, the pupils collect data to verify the hypotheses. On the basis of these collected data, it is decided whether these hypotheses may help in the solution of the problem or not.
   - (iv) In the fourth step, hypotheses are tested. Results are derived on the basis of these tests which are original ideas of the pupils.

3. **Social System**: In the reflective level of teaching, the classroom environment is open and independent. In such environment, the pupil occupies primary place and the teacher’s place is secondary. At the stage the teacher has three main functions:
   - (i) To present some problem before the pupils.
   - (ii) To use discussion and seminar during teaching.
   - (iii) To raise the level of aspiration of the pupils. All the pupils become active and sensitive for solving the problem. Hence, at this level, both self-motivation of the pupil and the social motivation have importance.

4. **Support System**: For reflective level of teaching, objective type tests are not useful. The proper evaluation of the pupils’ competencies can be done correctly by essay type tests. While examining reflective level, the following observations were made:
   - (i) The attitudes and beliefs of the pupils should be evaluated.
   - (ii) Their involvement in the learning activities should be evaluated.
   - (iii) It should be evaluated that how much development of the critical and creative competencies of the pupils has taken place.
Characteristics of Reflective Level of Teaching

Some of the characteristics of reflective level of teaching, as given by educational professor Hunt are as follows:

- In reflective level of teaching, no definite programme is followed as in the case of memory and understanding levels of teaching.
- In this level of teaching, only group-discussion method is considered effective.
- Reflective level of teaching cannot be restricted only to the curriculum, contents and text books.
- In the reflective level of teaching, pupils can criticize their teacher openly.

Suggestions for Reflective Level of Teaching

Hunt has presented the following suggestions to make the reflective level of teaching more effective:

- Teacher should allow those pupils’ entry into the reflective level of teaching who succeed in the tests of memory and understanding levels of teaching.
- In the reflective level of teaching, the teacher should follow all the four steps of this level observing the precautions.
- The teacher should raise the level of aspiration of the pupils to make the teaching at reflective level a success.
- In order to eliminate the weaknesses of a teacher, cognitive field psychology should be stressed.
- The teacher should create problems before the pupils so that original and creative thinking may develop in them.
- At the time of teaching, there should be a free and open environment so that the pupils may participate actively in discussion in order to solve the problems.

Check Your Progress

3. What are the two main characteristics of immediate memory?
4. State any characteristic of good memory.
5. What are the limitations of understanding-level model?

10.4 MODIFICATION OF TEACHING BEHAVIOUR

We will in this section discuss the modification of teaching behaviour which is carried primarily in two ways, i.e., microteaching and simulation.
10.4.1 Microteaching

A trainee teacher is bewildered by the complexity of teaching a large class of students and finds it very difficult to learn all aspects of teaching at the same time. It is easier for him to practice and learn one skill of teaching at a time. This problem was resolved by a process of training teachers in practical teaching. It came to be known as Microteaching. Microteaching is an excellent way of helping teachers and student-teachers to understand the process of teaching and learning better. It provides constructive feedback which helps teachers scrutinize their own teaching in order to discover their strengths and weaknesses. As a tool for teacher preparation, microteaching trains teaching behaviours and skills in small group settings, aided by video-recordings. Microteaching is a kind of real teaching reduced in time, number of students and range of activities. It provides teachers with ample opportunities to explore and reflect on their own and others’ teaching styles and to acquire new teaching techniques.

The history of microteaching goes back to the mid-1960s, when Dwight Allen and his colleagues from the Stanford University developed a training programme. This programme was aimed at improving verbal and non-verbal skills and general performance of teachers. The Stanford model had a three-step approach using actual students as authentic audience. The model was first applied to the teaching of science, but later it was introduced to language teaching. A very similar model called Instructional Skills Workshop (ISW) was developed in Canada during the early 1970s. It was a training support programme for college and institute faculty. Both these models were designed to enhance teaching and promote open collegial discussion about teaching performance.

Definitions of Microteaching

Microteaching had been defined in different ways by eminent professors and theorists follows:

- **D.W. Allen (1966):** Microteaching is a scaled down teaching encounter in class size and time.

- **R.N. Bush (1968):** Microteaching is a teacher education technique, which allows teachers to apply clearly defined teaching skills in carefully prepared lessons, in a planned series of 5–10 minute encounters with a small group of real students, often with an opportunity to observe the result on video tape.

- **Clift and others (1976):** Microteaching is a teacher training procedure which reduces the teaching situation to a simple and more controlled encounter achieved by limiting the practice of teaching to a specific skill and reducing teaching time and class size.

- **L.C. Singh (1977):** Microteaching is a scaled down teaching encounter in which a teacher teaches a small unit to a group of five students for a short period of five 5–20 minutes. Such a situation offers a helpful setting for an
experienced or inexperienced teacher to acquire new teaching skills and refine old ones.

- **N.K. Jangira and Ajit Singh (1982):** Microteaching is a training setting for the learning teacher, where complexities of the normal classroom teaching are reduced by: practising one component skill at a time, limiting the content to a single concept, reducing the size to 5–10 students, and reducing the duration of lesson to 5–10 minutes.

### Characteristics of Microteaching

The characteristics of microteaching are as follows:

- Microteaching is an experiment in the field of teacher education, which has been incorporated in the practice teaching schedule.
- Microteaching is a highly individualized training device.
- It is a student teaching skill training technique and not a teaching technique or method.
- The main objective of the microteaching session is to provide participants with an environment for practice-based teaching, to instil self-evaluative skills.
- Microteaching is a scaled down teaching encounter which reduces the complexities of real teaching such as the following:
  - Practising one skill at a time
  - Reducing the class size to 5–10 students
  - Reducing duration of the lesson to 5–20 minutes
  - Limiting the content to a single concept
- Students are provided with immediate feedback that helps in improving and motivating learning.

### Assumptions of Microteaching

Some of the important assumptions underlying the process of microteaching are as follows:

- Teaching is a complex process, but can be analysed into simple skills.
- Teaching skills can be practised one by one up to mastery level, under specific and simplified situation.
- Appropriate feedback, if systematically given, proves very significant in mastering each skill.
- When all skills have been mastered, they can be integrated for real classroom teaching.
- Skill training can be conveniently transferred from simulated teaching situation to actual classroom teaching situation.
Objectives of Introducing Microteaching in Colleges

Professors, Duggal and Sharma have listed the following objectives of introducing microteaching in colleges:

- To initiate trainee teachers to analyse and develop teaching behaviour under laboratory conditions.
- To land novice teachers gradually in the real classroom after gaining enough confidence.
- To impart intensive training in the component skills of teaching to teacher trainees at pre-service level.
- To involve the academic potential of teacher trainees for providing feedback to peers.
- To lessen the workload of teacher educators with the involvement of peer supervisors.
- To lessen the burden on practising schools.
- To explore human resources and economy to the maximum with respect to time, money and materials.

Phases of Microteaching Procedure

Microteaching involves the following three phases as suggested by theorists Cliff and others:

(i) **Knowledge acquisition phase:** In this phase, the student-teacher familiarizes himself with the component of teaching skill, which he is to practice. For this he learns about the skill, its rationale, its component behaviour and its role in the classroom. This can be done by reading the relevant literature, observing demonstrations and analysing the skill. All these activities are directed to the modelling component of microteaching. Modelling can be defined as the mode of presentation of the skill.

(ii) **Skill acquisition phase:** On the basis of the model presented, a student-teacher plans a micro-lesson for practising the demonstrated teaching skill and carries out microteaching till he acquires the desired level of mastery. This phase includes two components—feedback and microteaching setting. On the basis of classroom performance of the student-teacher, feedback is provided in order to modify the classroom performance. The setting component covers conditions like size of the micro class, duration of micro class and type of supervision.

(iii) **Transfer phase of microteaching:** Here, the student-teacher undertakes exercises for smoother transition from microteaching situation to real classroom situation. The component of this phase is integration of component teaching skills.
Microteaching Cycle

The six steps generally involved in microteaching cycle are: (i) plan, (ii) teach, (iii) feedback, (iv) re-plan, (v) re-teach and (vi) re-feedback. There can be variations as per the requirement of the objective of practice session. These steps are diagrammatically represented Figure 10.1.

(i) **Plan:** It involves selection of the topic and related content of such a nature, in which the use of components of the skill under practice may be made easily and conveniently. The topic is analysed into different activities of the teacher and the students. Activities are planned in a logical sequence where maximum application of the components of a skill is possible.

![Fig. 10.1 Microteaching Cycle](image)

(ii) **Teach:** It involves the attempts of the teacher trainee to use components of the skill in suitable situations, occurring in the process of teaching. If the situation is different and not as visualized, the teacher should modify his behaviour as per the demand of the situation in the class. The teacher should have the courage and confidence to handle the situation arising in the class effectively.

(iii) **Feedback:** Feedback refers to giving information to the teacher-trainee about his performance. The information includes strength as well as weaknesses related to his performance. This helps the teacher-trainee to improve upon his performance in the desired direction.

(iv) **Re-plan:** The teacher-trainee re-plans his lesson, incorporating the points of strength, and removing the points not skilfully handled in the previous attempt.

(v) **Re-teach:** It involves teaching the same group of students, if the topic is changed, or a different group of students, if the topic is the same. This is done to remove boredom or monotony of the student. The teacher-trainee teaches the class with renewed courage and confidence to perform better than the previous attempt.
Re-feedback: It is the most important component of microteaching for behaviour modification of teacher-trainee in each and every skill practice.

Indian Model of Microteaching

After several years of research and experimentation in microteaching, NCERT concluded that microteaching can be practised effectively in India without using any hardware, since symbolic and live modelling and verbal feedback have been found to be quite effective. Further, it is not necessary to use school students for microteaching; peers can act as students which have also been found to be very effective in bringing about improvement in the skill of teaching. NCERT has proposed the Indian model of microteaching, which has following salient features:

- The mode of presentation of theory and modelling is generally done through written material, lectures, demonstrations and discussions and not through electronic gadgets like VCR, audio-tapes and films, etc. Teacher educators give model lessons on various teaching skills. However, with the increased availability and use of video-camera, new technology in the use of CD for modelling and feedback purposes has been suggested.
- Live observers are used to observe teaching and for providing immediate feedback to student-teachers. Teacher educator and peers participate in feedback sessions.
- College-based teaching practice is organized under simulated conditions. Peers are used as students instead of real students. Training in role playing is given to student-teachers.
- The microteaching laboratory can function with minimum facilities according to the available space, material and equipment.
- The duration of microteaching cycle is:
  - Teach : 6 Minutes
  - Feedback : 6 Minutes
  - Re-plan : 12 Minutes
  - Re-teach : 6 Minutes
  - Re-feedback : 6 Minutes
- Two half cycle lessons are also practised instead of one full cycle. The Indian model has been successfully tried out, and is being used in many universities and teacher education institutions in the country.
Teaching Table 10.1 Comparison between Microteaching and Traditional Teaching

<table>
<thead>
<tr>
<th>Microteaching</th>
<th>Traditional Teaching</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching is relatively simple.</td>
<td>Teaching is comparatively complicated and difficult.</td>
</tr>
<tr>
<td>The number of students is less. A class consists of a small group of 5–10 students.</td>
<td>The number of students is much more; a class usually has more than 40 students.</td>
</tr>
<tr>
<td>There is provision of immediate feedback, which helps the teacher know his drawbacks.</td>
<td>There is no provision of immediate feedback.</td>
</tr>
<tr>
<td>The teaching time is 5–10 minutes.</td>
<td>The duration of traditional teaching is 40–45 minutes.</td>
</tr>
<tr>
<td>The student-teacher practises only one skill at a time.</td>
<td>The student-teacher practises a combination of skills.</td>
</tr>
<tr>
<td>In microteaching, the role of a supervisor is specific and definite.</td>
<td>The role of a supervisor is quite vague in the case of traditional teaching.</td>
</tr>
<tr>
<td>The patterns of classroom interaction can be studied objectively.</td>
<td>The patterns of classroom interaction cannot be studied objectively.</td>
</tr>
<tr>
<td>Microteaching is done in fully controlled conditions.</td>
<td>This teaching does not take place in controlled conditions.</td>
</tr>
</tbody>
</table>

Teaching Skills through Microteaching

We know that microteaching is a controlled practice which makes it possible to concentrate on a specific teaching behaviour. Competence is acquired in one skill before proceeding to another skill. Microteaching can be practised only after a teacher’s behaviour has been analysed and specific skills of teaching have been identified. A teaching skill is a set of interrelated components of teaching behaviour for realization of specific instructional objectives (Jangira et al., 1982). Allen and associates (1967), at Stanford University identified a set of 14 skills of teaching. In India, Passi and associates (1974) working at the Centre for Advanced Studies in Education at M.S. University, Baroda, identified 21 skills of teaching. Some of the important skills of teaching have been explained in the following section.

- **Skill of stimulus variation**: Skills of stimulus variation are used to bring desirable changes of variation in the stimuli used to secure and sustain student’s attention towards classroom activities. Some of the things a student-teacher is trained in are the use of movement in a systematic way, use of gestures, development of verbal and non-verbal methods of focusing children’s attention, systematic use of pauses, and controlled use of sensory channels by switching primary modes of communication going. This skill helps to increase active participation, enthusiasm and spirit of study.

- **Skill of introducing the lesson**: Skill of introducing the lesson is mainly concerned with establishment of rapport between teacher and students for
involving students in the lesson. The main components of this skill are utilization of previous experience and appropriate devices, maintenance of continuity in main parts of the introduction and relevancy of verbal and non-verbal behaviour.

- **Skill of explaining**: Explanation is the use of interrelated facts, concepts with a view to develop understanding among the students towards the content under study. In order to become an effective explainer in the classroom, the teacher should practise more.

- **Skill of reinforcement**: Every responding student of the class needs social approval of his behaviour. To satisfy this need, he is always eager to answer each question known to him. If the teacher encourages students, their participation in the class is maximized. The main purpose of the skill is to increase student participation, facilitate learning, motivate the learner, modify undesirable behaviour and develop desired behaviour.

- **Skill of questioning**: Questions are helpful in stimulating thinking and hence, significantly contribute in classroom teaching. It helps a teacher in gaining knowledge about previous awareness and entry behaviour of students, their interest and attitude towards the subject and the topic in hand. Adequate questioning skills may help the teacher in carrying out effective interaction with his students, including motivation and drawing their attention towards teaching.

- **Skill of lecturing**: Skill of lecturing is concerned with effective presentation of the content. The teacher leaves his impression by using many techniques and tactics through this skill. Sometimes, it is also known as communication skill.

- **Skill of illustrating with examples**: Skill of illustrating with examples is mainly concerned with the selection of examples relevant to the concept so that the content under study may be clear and understandable to students. Examples contribute significantly in teaching-learning process and are helpful in sustaining the attention of students.

- **Skill of classroom management**: Skill of management involves efforts made by the teacher to compel a child to participate actively in classroom activities. In this skill, the teacher supervises the activities of students, sets norms for their classroom behaviour, asks questions, etc.

- **Skill of using audio-visual aids**: Audio-visual aids attract and hold attention of students and makes teaching more interesting and effective. Use of these aids breaks the monotony of ordinary instructions, helps in forming the right mental images, stimulates critical thinking, and increases the power of retention.

- **Skill of using blackboard**: Blackboard is a very essential component of teaching-learning process. It is a cheap device and plays a very important
role in attracting the attention of students. The skill of blackboard writing requires neatness, appropriateness of written work, simplicity and brevity in the points presented, legibility, etc.

- **Skill of closure:** Closure is attained when major purposes, principles and constructs of a lesson or portion of the lesson have been learnt and the students are able to relate new knowledge to the past. It is more than a quick summary of the portions covered.

### Advantages of Microteaching

Microteaching is very helpful for making the process of teaching more effective and successful. Some of the advantages of microteaching are as follows:

- It enables teachers to focus on certain areas of teaching and to view them from different perspectives.
- It increases training-effectiveness using a scaled down teaching simulation environment, which reduces the complexities of normal classroom teaching and eliminates the pressure resulting from real classroom settings.
- One major advantage of microteaching is the provision of immediate feedback to bring improvement in teacher’s behaviour.
- The main objective of microteaching session is to provide the participants with an environment for practice-based teaching to instil self-evaluative skills.
- It caters to the need of individual differences in teacher training. Each trainee develops teaching skills at his own pace.
- It employs real teaching situations for developing skills.
- Microteaching gives instructors an opportunity to be analysed by a small group audience, and also to observe and comment on other people’s performances.
- It is hardly a substitute for teaching practice, but it offers advantages such as close supervision, manageable objectives established according to individual trainee needs and progress, continuous feedback, an unprecedented opportunity for self-evaluation, immediate guidance in areas of demonstrated deficiency and the opportunity to repeat a lesson whenever desired.
- Through microteaching, teachers are able to pursue self-initiated, self-directed and self-observed growth.
- It is a very useful method for both pre-service and in-service teacher education.
- Microteaching offers the advantages of both controlled laboratory environment and realistic practical experience.
- A microteaching session is a chance to adopt new teaching and learning strategies.
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Self-Instructional Material

- It is well suited to help teachers identify single concepts, and learn how to create learning modules to build longer lessons.
- Microteaching can also be used in research work in various situations related to teaching.

Disadvantages of Microteaching

The disadvantages of microteaching are as follows:

- It is skill-oriented rather than content-oriented. The main emphasis in this technique is on learning teaching skills and content, which is an important part of teaching-learning, is given adequate attention.
- It is performed in artificially controlled conditions.
- The main emphasis of microteaching is on mastery of one teaching skill at a time, whereas actual teaching is combination of many skills that operate simultaneously.
- It is a time-consuming technique since one trainee practises a skill in about 35 minutes.
- An effective microteaching technique requires tape records, video tapes and closed circuit cameras. Thus, it is costly for Indian schools.
- For successful implementation, microteaching requires competent and suitably trained teacher educators.
- Microteaching alone is not sufficient to attain perfection in teaching. It needs to be supplemented and integrated with other teaching techniques.
- It cannot be a substitute for real classroom lesson.

10.4.2 Simulation

Experiential learning allows students to apply and test what they learn in their textbooks and often helps to increase students’ understanding of the subtleties of theories or concepts. It draws students who can be alienated by traditional teaching approaches. In role-play situation, students need to make decisions and often have to convince others to work with them. Simulations also provide students with the opportunity to develop their communication, negotiation and critical thinking skills and in many cases improve teamwork skills. Simulations are a useful teaching strategy for illustrating a complex and changing situation. Simulations are (necessarily) less complex than the situations they represent.

A simulation is a form of experiential learning. Simulations are instructional scenarios where the learner is placed in a situation defined by the teacher. They represent a reality within which students interact. The teacher controls the parameters of this situation and uses it to achieve the desired instructional results. Simulations are in a way lab experiment where students themselves are the test subjects. They experience the reality of the scenario and gather meaning from it. It is a strategy that fits well with the principles of constructivism.
Definitions of Simulation

Some popular definitions of simulation as given by theorists are as follows:

- Simulation is a replica of a real world situation worth learning. An educational simulation permits a person to become a working member of the system, to set goals, to develop policies, to analyse information and make decisions (Klietsch, 1973).
- Simulation provides a simplified version of reality: an approximation of reality (Dhand, 1973).
- Simulation is a means of allowing student to live vicariously. It enables the teacher to manipulate various courses of action and their consequences (Broadbelt, 1969).

Assumptions of Simulated Teaching

Some the basic assumptions of simulated teaching are as follows:

(a) **Teacher behaviour is modifiable**: The first assumption is that with the help of feedback devices, a teacher’s behaviour can be modified and developed.

(b) **Patterns of teacher behaviour are essential**: There are certain patterns of teacher behaviour, which are essential in effective teaching. These patterns may be described and practised like any other skill.

(c) **Teacher behaviour has taxonomy**: According to professor, Karl Openshaw and others, the taxonomy of teacher behaviour is developed by the use of simulated technique as:
   (i) Source dimension
   (ii) Direction dimension
   (iii) Function dimension
   (iv) Sign dimension

(d) **Social skills are developed**: Another assumption is that social skills are developed by practice and imitation in a group. The members of the group have an opportunity to practise controlling and improving their own behaviour for teaching purposes.

(e) **Use of feedback**: The feedback mechanism can be used to modify the social communication skills of student-teachers.

Objectives of Simulated Teaching

According to theorist Flanders, simulated teaching has the following objectives:

- To ask open or closed questions at appropriate time.
- To ask a question which lifts the current level of abstraction, or a question that lowers it.
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- To ask questions from areas, the concepts and logical connections of which have been expressed by students previously.
- To summarize all that has been previously said by the students.
- To make appropriate use of ideas expressed previously by students.
- To make constructive use of positive and negative feelings of students.
- To provide reasons for praising or blaming.
- To predict the consequences which follow alternative actions.
- To assist student to compare the consequences of alternative actions through speculation before discussions are arrived at.
- To guide constructive discussions.
- To clarify the first steps needed to start work in ways that are in accordance with the interests and abilities of students.
- To organize student’s ideas in terms of teaching objectives.
- To demonstrate and explain the rules of logic in classroom discourse.
- To assist students to maintain consistency in the meaning of words and distinguish matters of facts, opinions and values.

Educational Uses of Simulation

Simulations can typically be adapted internally to address the specific circumstances of students and the class environment. They can also be offered as a replacement for other teaching strategies, thus themselves being an adaptation. Renowned author, Vandana Mehra in her book, _Education Technology_, has explained the uses of simulation in the following lines:

- Simulation establishes a setting where theory and practice can be combined.
- Simulation provides funny, interesting and meaningful learning experiences.
- A well-designed simulation can achieve positive transfer of learning.
- Helps participants develop their initiative powers and creative thought.
- Simulation helps to foster content related to cognitive outcomes, non-cognitive skills (such as decision-making, communication and interpersonal skills) and desirable attitudinal traits (such as willingness to listen to other people’s point of view) or appreciate that most problems can be viewed in a number of different ways.
- Motivates participants to commit themselves whole heartedly to the work of the exercise.
- Simulations that are multidisciplinary in nature help participants to integrate concepts from related areas into a cohesive and balanced picture.
- Simulations help in reinforcing facts and principles after they have been taught.
- Especially in sciences, simulations help to develop laboratory skills in situations where conventional experiment is either extremely difficult or impossible.

**Types of Simulation**

Educational theorist, Norman has identified the following types of simulations:

(i) **Identity simulation:** In identity simulation, the actual system is used as model.
(ii) **Replication simulation:** In replication simulation, an operational model of the system is used in its usual environment.
(iii) **Laboratory simulation:** In laboratory simulation, replication is employed in the laboratory, with features of the real system represented.
(iv) **Computer simulation:** Computer simulation is an abstract representation of the real system with the use of a computer.
(v) **Analytical simulation:** Analytical simulation uses mathematical models and attempts to get solution by analytical means.

**Procedure of Simulated Teaching**

Professor Flanders has recommended six steps for using simulated teaching exercise. They are as follows:

1. **Assignments:** First of all, a small group of student-teachers is selected. Each student-teacher in the group is assigned a number or letter. A system is built to rotate the role so that each individual gets a chance to be an actor, or an observer.
2. **Selection and discussion of the skills:** In this step, the group decides and discusses the skill which is to be practised and lists down the topics of conversation that fits the skill. Each actor in the group can select a topic from this list that makes him comfortable in this role.
3. **Deciding considerations:** In the third step, a sequence of activities is determined. Here, the following are decided:
   - Who starts the conversation
   - Who will intervene
   - Who will start the interaction
   - When will it be stopped
4. **Deciding the procedure of evaluation:** The kind of data the observer needs to record and the method to be used to record the data is decided.
5. **Conducting practice session:** Here, the first practice session is conducted and the actor gets feedback for his performance. The procedure of the second session is changed, if it is required to improve the training procedure.
When each person has had the opportunity to be an actor and the practice session starts working properly, the task difficulty should be increased by restricting the actor’s role.

6. **To appraise and redesign the procedure:** One should be prepared to change the procedure and topic and then move on to the next skill, if needed.

**Teacher Training and Simulated Teaching**

Simulated teaching is one of the techniques used in India and other countries for the modification of teacher behaviour. Here, attempts are made to create artificial teaching–learning situations within the environment of the training institute and the student-teachers are required to play the role of teachers, students and supervisor.

The main steps involved in this technique are as follows:

1. **Orientation:** First of all, student-teachers should be introduced to the concept and background of simulated teaching. Some important aspects of simulated teaching should be explained to student-teachers which include the following:
   - Concept of simulated teaching.
   - Importance and rationale of using simulated teaching for their training.
   - The steps of procedure followed in its use.
   - Necessary requirements and setting for adopting simulated teaching.
   - Selection of the theme for teaching.

2. **Giving demonstration lesson:** The teacher educator should try to give a demonstration of good teaching for practice of the skill selected. It will help student-teachers to understand the methodology to be employed during the practice of skill.

3. **Assignment of roles:** Every student-teacher in the group is going to play three different roles—teacher, student and observer. Therefore, prior judgment is required for deciding the order in which student-teachers will play their respective roles. However, it is to be remembered that irrespective of the order, everyone has to play all the three roles at one time or the other in the overall process of simulation.

4. **Selection of skill for practice:** After assigning roles, each trainee is now helped in the selection of suitable topics of his interest, in view of the skill to be practised. First of all, one topic is selected for practice, then it is decided which should be the other topic so that other student-teacher may also go for practice in accordance with their assigned roles.

5. **Preparation of work schedule:** Here, the whole plan of the process is decided. The anticipated classroom interaction is planned, with respect to the role of trainees. The entire work schedule is to be prepared before starting the actual process.
6. **Determination of observation technique**: The procedure and technique of observation is decided and planned in advance. It also includes which type of data is to be collected and how this data is to be interpreted? The decision regarding the use of these observations in providing feedback to the teacher actors is taken in advance.

7. **Organization of first practice session**: The first practice session is organized after all above mentioned preparations. The student-teachers are asked to deliver lessons one by one to their peers who are playing the role of students. All good and weak points of teaching, concerning classroom interaction, teacher’s behaviour, content taught, skills practiced and methodology used are being noted down by student-teachers who are playing the role of observers.

8. **Follow-up during subsequent practice session**: After desirable modifications in the first session, subsequent sessions are conducted till the goals of practicing teaching skills are not achieved. In this changed procedure, the roles of student-teachers are also changed so that all of them are provided with the opportunity to practise teaching skills.

**Precautions in Simulated Teaching**

The precautions to be taken in case of simulated teaching are as follows:

- Teachers must be completely familiar with the technique in order to maximize student learning.
- Teachers should ensure that students understand the procedures before beginning the process.
- Teachers must divide students into groups in a proper manner so as to have a positive impact of learning.
- Teachers should be knowledgeable and facilitators of the process.
- Sufficient time must be allocated to provide opportunity to student-teachers to play different roles.
- For practice, student-teacher should prepare micro-lesson plans.
- If possible, students should be made aware of specific outcomes expected of them.
- At the end of the process, a discussion should be followed so that student-teachers may bring desirable changes in their behaviour.

**Advantages of Simulated Teaching**

The following are the main advantages of simulated teaching:

- It can be used to analyse complex real classroom situations which may help in solving serious teaching problems. Good simplifications provide students with a better insight into reality, than by examining all components of a complex situation.
Teaching

NOTES

• The process of simulation is focused on the individual, but makes use of a learning group to support decisions and provide reflection. This emphasizes inquiry, skill development, collaboration and reflection.

• The structure of a devised simulation incorporates feedback and advice, specifically through devices such as a thinking space plus the opportunity to repeat a lesson and explore alternative decisions. Usually, this is not feasible in traditional modes of classroom experience for pre-service teachers.

• Simulation creates an interactive educational setting which offers the possibility to effect changes in relation to the learning experience in a more efficient way, than is normally possible with other didactic methods.

• Student-teacher gets an opportunity to play three different roles of: student, teacher and observer.

• Simulations also provide students with the opportunity to develop their communication, critical thinking skills, and decision-making and teamwork skills.

• It increases the students’ interest, motivation and efforts for learning about a subject or phenomenon.

• Students get an opportunity to imbibe useful qualities for social participation and cooperation by giving due regard to others’ feeling and viewpoints.

• The technique is helpful in acquiring various teaching skills.

• Simulated teaching helps students in understanding behavioural problems of the classroom and also assists in developing an insight to encounter them.

• It helps in acquiring classroom manners.

• One of the major advantages of simulated teaching is that it establishes a link between theory and practice.

• This technique helps in developing the ability to ask the questions in student-teachers.

• A simulation stimulates active engagement of students. They actually participate and not just read and analyse. They make decisions and see the results of their decisions in the responses from other students, and the outcome of the simulation.

• With simulations, students can explore the impact of multiple decisions at the same time. Simulations also allow students to validate their common sense, relative to a particular situation.

• Simulations provide varieties in pedagogy. They also provide rapid feedback on student decision-making, which is so critical for their learning.

• Simulation is very useful for gifted and slow learners.

• It develops confidence in student-teachers, which help them to confront tough situation.
Disadvantages of Simulated Teaching

The following are the disadvantages of simulated teaching:

- Students may not understand problems of the classroom with needed effectiveness.
- This technique requires expertise on part of the teachers and very few teachers are ready to take extra burden.
- This technique creates an artificial situation which is away from reality.
- If audiovisual aids are to be used in classroom situation, special facilities and expensive equipment are essential.
- It is a time-consuming process in terms of planning, preparation, organization, presentation and evaluation.
- In this technique, student-teachers play the role of students. As they are quite mature, we cannot expect them to play the role of children.
- This technique cannot be used for the curricula of all subjects.

Check Your Progress

6. What are the two main components of the skill-acquisition phase of microteaching?
7. Why are question skills important in microteaching?
8. What are the advantages of simulation?

10.5 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. Israel Scheffler has defined teaching as an activity which is aimed at the achievement of learning and practiced in such a manner as to respect the student’s intellectual integrity and capacity for independent judgement.
2. Instruction cannot reach to the high level of teaching. On the other hand, teaching includes the presence of a teacher, participation of the students and their activeness, while these are not essential in instruction. Instruction is possible through radio, tape-recorder and television. In the teaching process, such type of hardware material related to the instruction can be used.
3. The two main characteristics of immediate memory are as follows:
   (a) It is temporary. It is possible that the learnt material may not retain for a longer period.
   (b) Its development occurs along with age.
4. One of the important characteristic of good memory is retention of learnt material for a longer duration. The pupils are said to have a good memory if they retain what they have learnt for a longer time. Its reverse i.e. the pupils who cannot retain for a longer time are said to have bad memory.

5. The two main limitations of understanding-level model are as follows:
   (a) It stresses upon the mastery of the content. Hence, human behaviour is overlooked.
   (b) It does not help in developing affective and psychomotor aspects.

6. The two main components of the skill-acquisition phase of microteaching are feedback and microteaching setting.

7. Question skills are important in microteaching because adequate questioning skills may help the teacher in carrying out effective interaction with his students, including motivation and drawing their attention towards teaching.

8. The following are the advantages of simulation technique:
   (a) Simulations also provide students with the opportunity to develop their communication, critical thinking skills, and decision-making and teamwork skills.
   (b) It increases the students’ interest, motivation and efforts for learning about a subject or phenomenon.
   (c) Students get an opportunity to imbibe useful qualities for social participation and cooperation by giving due regard to others’ feeling and viewpoints.
   (d) The technique is helpful in acquiring various teaching skills.

10.6 SUMMARY

- Teaching is not a single activity. It can be interpreted in its molecular form. It can be viewed as a family of activities. In this family of activities, every activity becomes important.
- Training is the part of teaching. The more the intelligence exhibited in the training programme, more it would be closer to the teaching-process and would resemble with teaching.
- Instruction is also one of the activities related to teaching. Sometimes, we term instruction as teaching. However, instruction and teaching are not the same.
- Instruction is possible through radio, tape-recorder and television. In the teaching process, such type of hardware material related to the instruction can be used.
Indoctrination is the highest level of teaching. At this level, more intelligence is expected. All the great men, politicians and leaders influence other people with the support of their ideology, thoughts, assumptions and beliefs.

Teaching is a purposeful process which has close relationship with learning. Therefore, in the modern age, teaching and learning, both, are accepted as one concept.

Memory level teaching is 'thoughtless'; it is the initial stage of teaching. Understanding level of teaching is the next higher level of memory level teaching.

Memory level is the level of cramming. In the teaching of this level, the facts and the information of the cognitive level are forcibly supplied to the brains of the pupils externally. Pupils recall and recognize this forcibly-retained knowledge when needed.

In the memory level teaching, signal learning, chain learning and stimulus-response learning are emphasized.

Memory level teaching proves to be beneficial as it provides basic foundation for understanding level and reflective level teaching.

Memory level teaching is a pre-requisition for understanding level teaching. It is a figment of imagination to have results without this level.

In the understanding level of teaching, the teacher tries to present his instructions in way that students could understand properly.

The model of understanding level teaching was indoctrinated by professor, H.C. Morrison. Hence, it is named as Morrison’s Teaching Model.

Reflective level of teaching includes both understanding and memory-level teaching. Reflective level of teaching does not succeed if the teaching of memory and understanding levels has not taken place earlier.

Theorist, M.L. Bigge has rightly written about reflective level of teaching while clarifying it; he opines that reflective level of teaching tends to develop the class-room atmosphere which is more alive and exciting, more critical and penetrating and more open to fresh and original thinking.

Microteaching is an excellent way of helping teachers and student-teachers to understand the process of teaching and learning better. It provides constructive feedback which helps teachers scrutinize their own teaching in order to discover their strengths and weaknesses.

The six steps generally involved in microteaching cycle are: (i) plan, (ii) teach, (iii) feedback, (iv) re-plan, (v) re-teach and (vi) re-feedback.

Microteaching can be practised only after a teacher’s behaviour has been analysed and specific skills of teaching have been identified. A teaching skill is a set of interrelated components of teaching behaviour for realization of specific instructional objectives.
Experiential learning allows students to apply and test what they learn in their textbooks and often helps to increase students’ understanding of the subtleties of theories or concepts.

Simulations are a useful teaching strategy for illustrating a complex and changing situation. Simulations are (necessarily) less complex than the situations they represent.

Simulations are in a way lab experiment where students themselves are the test subjects. They experience the reality of the scenario and gather meaning from it. It is a strategy that fits well with the principles of constructivism.

Simulations can typically be adapted internally to address the specific circumstances of students and the class environment. They can also be offered as a replacement for other teaching strategies, thus themselves being an adaptation.

Simulation creates an interactive educational setting which offers the possibility to effect changes in relation to the learning experience in a more efficient way, than is normally possible with other didactic methods.

With simulations, students can explore the impact of multiple decisions at the same time. Simulations also allow students to validate their common sense, relative to a particular situation.

10.7 KEY WORDS

- **Memory**: It refers to a new experience determined by the dispositions laid down by a previous experience, the relation between the two being clearly apprehended.
- **Microteaching**: It refers to a teacher training procedure which reduces the teaching situation to a simple and more controlled encounter achieved by limiting the practice of teaching to a specific skill and reducing teaching time and class size.
- **Permanent memory**: It refers to a type of memory in which a person is able to remember a learnt material for a long time.
- **Teaching**: It refers to type of activities which are designed and performed to produce change in student behaviour.

10.8 SELF ASSESSMENT QUESTIONS AND EXERCISES

Short Answer Questions

1. How is teaching different from indoctrination?
2. Why is memory level teaching technique considered as thoughtless?
3. How is memory classified?
4. Write a short note on the model of understanding level of teaching.
5. What are the main characteristics of reflective model of teaching?
6. How is microteaching different from traditional teaching?
7. What is microteaching cycle?
8. What are the basic assumptions of simulation teaching?

Long Answer Questions

1. Why is teaching not considered as a single activity? Discuss in detail.
2. Explain the various phases of memory.
3. Describe the reflective level of teaching.
4. Discuss the relationship between teacher training and simulated teaching.
5. Elaborate the advantages and disadvantages of microteaching.
6. Analyse the uses of simulation teaching.

10.9 FURTHER READINGS

UNIT 11 MODELS OF TEACHING

11.0 INTRODUCTION

The term ‘model’ means a pattern of something to be made or reproduced. In another way, it can be referred to as ‘an example of imitation’.

The meaning of a model can also be made clear in these words – ‘an effort to draw some meaning from experience’. In the field of education, this idea helps in many ways. Some of the important topics, such as role of teaching models, concept attainment model, families of models of teaching and advance organizer teaching model will be discussed in detail in this unit.

In this unit, the concepts and families of model of teaching have been explained. The elements of concept attainment method and characteristics of inquiry training model have been discussed. The unit will also highlight the elements of advance organizer training model and jurisprudential teaching model.

11.1 OBJECTIVES

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

- Discuss the concepts of models of teaching
- Explain the families of models of teaching
- Analyse the elements of concept attainment model
- Identify the characteristics of inquiry training model
- Describe the elements of advance organizer training model and jurisprudential teaching model
11.2 CONCEPT OF MODELS OF TEACHING

According to theorist, Ryans, a ‘model’ is a term which suggests us a framework of analysis and observation. In simple words, a model can be defined as an object or a sample which can be reproduced. On the basis of this meaning, we can say that the teaching model is a sort of pattern of planning in which we select the instructional material after deciding the curriculum, and guide the functions of the teachers. A model enables the teacher to decide his teaching strategy.

According to professor Hyman, ‘the model is a way to talk and think about instruction in which certain facts may be organized, classified and interpreted.’

Assumptions of Teaching Models

The following are the basic assumptions of teaching models:

1. Teaching is a means for generating an environment of learning.
2. The content and skill function as an instruction through which students and teacher interact to one another. Thus, it provides an opportunity to develop physical and social efficiency.
3. Different types of teaching objectives are achieved by organizing teaching elements in different ways.
4. Teaching models provide the learning experiences by creating appropriate environment for real behaviour outcome.

Fundamental Elements of Teaching Model

A teaching model generally consists of four fundamental elements. An outline of a teaching model can be explained with the help of these four elements. The following are the four elements which form the layout of a teaching model:

1. **Focus**: The term ‘focus’ refers to the goal or objective of teaching. The teaching activities are oriented to achieve some goals in life. To be able to achieve goals is the most desirable aspect in the life of the students.
2. **Syntax**: The syntax of the model involves a description or structure of activities. It indicates the shape of the activities which specify educational environment relating to each model. It refers to the presentation aspect of teaching.
3. **Social system**: The social system of a teaching model includes three things:
   (a) A description of the kinds of student teacher roles.
   (b) A description of hierarchical relationship.
   (c) A description of the kinds of norms that are encouraged and student behaviour which is rewarded.
4. **Support system**: The support system is needed in order to create the environment specified by the model. It is additional requirement beyond
the usual human skill, capacities and technical facilities. The support system includes two sources:

(a) The role of specification for the teacher.
(b) Requirements of the substantive nature i.e. experts and knowledge of the experts. Thus, the support system helps to generate desirable classroom environment.

Role of Teaching Models

The main functions of teaching models are as follows:

- It may help a teacher in enhancing his ability to teach students and create conductive environment for them.
- It may help the curriculum-makers in planning curriculum which provides a variety of educational experiences to students.
- It may help in creating interesting and effective instructional material.
- It may stimulate the development of new educational forms, the educational opportunities.
- It may help in formulating a new theory of teaching.

Check Your Progress

1. What are the two main sources of support system?
2. How has Hyman defined the term “model”?

11.3 FAMILIES OF MODELS OF TEACHING

A number of eminent scholars have introduced different types of families of models of teaching. John P. Dececco, an American academic has classified models of teaching into four basic psychological classes or families. Professor, Schefler has arranged these models into three families. Renowned scholar, E.C. Hayden has described four types of models of teaching. Theorist, Marsh Well has divided all models into three chief classes or families which are as follows:

1. Information process model family
2. Social process family
3. Personal model family

Educational theorist, Travers has divided all these models of teaching into three families as per his own system.

The most widely accepted classification has been given by scholars Joyce and Weil. They have developed more than 20 models. These models have been
divided into four chief families on the basis of their chief characteristics and nature (that how they coordinate with educational objectives and means).

Glaser’s teaching model is considered as a Basic Model of Teaching as propounded by John P. Dececco.

1. **Historical Teaching Models**
   - The Socratic Teaching Model
   - The Classical Humanistic Model
   - The Personal Development Model

2. **Philosophical Teaching Models**
   - The Impression Model of Teaching
   - The Insight Model of Teaching
   - The Rule Model of Teaching

3. **Psychological Teaching Models**
   - Robert Glaser’s Basic Teaching Model
   - A Computer Based Teaching Model
   - A Model for School Learning
   - An Interactional Model of Teaching

4. **Teaching Models for Teacher Education**
   - Taba’s Teaching Model
   - Turner’s Teaching Model

5. **Modern Teaching Models**
   - The Social Interaction Teaching Model
   - The Social Inquiry Teaching Model
   - The Concept Attainment Teaching Model
   - Inductive Teaching Model

Figure 11.1 shows some other families of models of teaching.
Dr S.S. Mathur has described these four classes or families of models of teaching as follows:

1. **Social Interaction Models**

   Social interaction model lays emphasis on social relations. Some of the important characteristics of the model are as follows:
   - It focuses on the process by which reality is discovered by sociality.
   - It lays emphasis on the ability of an individual by which he improves his relations with others.
   - It lays emphasis on improvement of democratic activities and betterment of society.
   - It focuses on development of an individual’s mind and soul.

2. **Information Processing Models**

   Information processing model family lays emphasis on information-processing ability of students, and the system by which this ability can be enhanced. Information processing indicates those types which an individual adopts to adapt stimuli got
from the environment, to understand problems for organizing the given material, to solve problems and to use verbal and non-verbal symbols. Some models are concerned with general intelligence ability and thus, lay emphasis on productive thinking. This model also pays attention to social relations.

3. **Personal Models**

The model inclines towards an individual person and is focused on self-development. It emphasizes on the process by which an individual forms his specific situation and organizes it. Often, it also focuses on an individual’s emotional aspect. It is expected that an individual is given assistance to make productive relation with his environment, and to understand himself as an able person, then interpersonal relations will be improved and proficiency will be achieved in gaining even more effective knowledge.

4. **Behaviour Modification Models**

The fourth type of model was developed on the basis of those efforts which have been made for the cultivation of skilled systems and to change behaviour formulation feedback. An American psychologist, B.F. Skinner is the exponent of this model. We include such type of model under the behaviour modification principles because they lay emphasis on the change of external behaviour of the learner, and describe them in terms of direct behaviour, and not in relation to that behaviour which is inherent and invisible. Skinner’s principle, also called Operant Conditioning Law, is used in several fields, such as education and other fields ranging from military training to medical treatment.

These models of teaching are not isolated from each other but are interlinked. The approaches which are described by some of them for the development of teaching process though belong to different families, yet they lay emphasis on similar type of approaches. Besides, many aspects about the models of one family and the methods of teaching laid down by them are similar with those of others in relation to the teaching processes, and the meanings attributed to them. In this context, we can say that each task that we do is personal. Thus, most of our experiences, especially educational, are related to intelligence or knowledge.

Skill in teaching can be called as mastery over the models of teaching. When a teacher is skilled to effectively use these models, his skill is further enhanced. A good teacher constructs new models himself and tests them as he teaches his students.

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**Check Your Progress**

3. What are the important characteristics of social interaction model?

4. State the premise of information processing.
11.4 CONCEPT ATTAINMENT MODEL

The concept attainment model was developed by an American psychologist, J.S. Bruner and his associates. A teacher provides correct information about the nature of concepts by its use. This model is used for the explanation of new concepts effectively. In this model, similarity or dissimilarity between two or more objects is made out in order to complete the process by integrating facts in different ways.

‘A concept is a symbol that stands for a class or group of objects or events that possess common properties. Concepts greatly simplify our thinking processes. They make us free from having to level and categorize each new object or event we encounter.’

The objective of the concept attainment model is to enhance the ability for inductive reasoning in students and to develop concepts in them. Dr Anand has expressed his views about construction of concepts in human beings and has said that Bruner and his associates believe that the environment in which a human being lives is so diverse and complex that he cannot understand them without classification. Therefore, every human being tries to understand the objects found in his environment and classifies them. As a result of this classification, he develops concepts. These concepts are developed naturally, still training becomes essential in order to develop concepts correctly. This model is considered to be a good means of concepts.

11.4.1 Main Elements of Concept Attainment Model

The chief elements of concept attainment model are as follows:

1. **Focus:** The chief objective or focus of this model is to cultivate inductive reasoning ability. Its basis is psychology. Under this model, a student learns about different concepts on the basis of classification of different events, individuals and objects into different groups.

Bruner and his associates have given four objectives of this model which are as follows:

(a) To provide students with the knowledge of nature of concepts so that they can gain skill to classify objects on the basis of their characteristics and attributes.

(b) To enable students so that they can develop correct concepts.

(c) To cultivate specific concepts in students.

(d) To cultivate thinking strategies in students.

2. **Syntax:** The skills are cultivated in this structure in four steps, which are as follows:

(a) **Gathering of data:** A student is presented with different types of data related to an event or individual. With the help of these data, a
student limits different types of characteristics in one group in order to develop different concepts. In other words, different types of information are given to a student by which he can comprehend about concepts through examples.

(b) Strategy analysis: In this step, a student analyses the data. Mostly this analysis is based on ‘from general to specific’.

(c) Presentation: In this step, student analyses different types of concepts and characteristics on the basis of his age and experiences, and presents this analysis in a written report.

(d) Practice: The practice step comprises the use of the learnt concept, practising it, analysing it and constructs a concept on the basis of unorganized data.

3. Social system: In this, a teacher motivates a student and guides for the formulation and analysis of concepts. A teacher occupies an important place in this model because he places different data before a student. He makes students determine his project and guides them. The chief aim of a teacher is to help the students formulate a concept.

4. Support system: In the evaluation of this model, essay-type and objective-type tests are used and by them, new concepts are informed about through evaluation, improvement and modification.

Under this model, a student needs to act on the previous concepts. The support system is a very useful approach for the overall understanding of concepts.

11.4.2 Characteristics of Concept Attainment Model

The characteristics of the concept attainment model are as follows:

- When an effort is made to learn and understand concepts on the basis of examples, this model proves more useful.
- It cannot be used for imparting knowledge of facts, for answering ‘why’ and to tell reasons.
- It is very useful in language learning.
- It makes an effort to teach fundamental principles of mathematics and science easily.
- It proves to be more useful when it comes to subjects which provide more opportunities for concept formation.

The model has been found useful in teaching most of the subjects. This model has proved useful at all levels of teaching as well. If a teacher wants to use this model while teaching small children, it should be used for simple concepts and examples. This model is not used for imparting new knowledge. The information processing models are more useful for imparting new knowledge.
This model is used in the teaching of all subjects, but its utility is found to be effective in language learning, language-concept formation and language science.

### Check Your Progress

5. State the objective of concept attainment model.

6. What are the characteristics of concept attainment model?

### 11.5 INQUIRY TRAINING MODEL

The inquiry training model was developed in 1966. Renowned author and scholar, Richard Suchman believes that a child is curious by nature and the child feels joy when his question is answered. This model enhances individual development and mental abilities of a child, by which he can be trained in scientific attitude and natural faculties.

The model is based on scientific concept and scientific method which trains a student for scholarly inquiry. In this, students are given freedom to inquire, by which they are motivated to ask questions in a disciplined manner. In this type of inquiry, students discover new dimensions.

The chief elements of this structure are given as follows:

1. **Focus:** The chief objective of this model is to develop cognitive skills in a child. A student analyses concepts logically through inquiry. It helps in the cultivation of scientific attitude. It cultivates students’ curiosity, aptitude and attitude, by which he is motivated to deal with any kind of situations.

2. **Structure:** The structure of this model has five stages:

   (a) **Presentation of problem:** In this, a student selects a problem under the guidance of his teacher.

   (b) **Conducting experiment about the problem:** In order to gather data about the problem, a student asks questions for about half an hour which are replied in yes/no by the teacher. This inquiry by a student continues until the time he arrives its clarification. A teacher tells his students that they should not ask for the solution directly. He also guides them to ask as many questions as they may want, and can seek advice from or discuss with the fellow students.

   (c) **Effort for problem-solving by students and teacher:** In this, a student gathers data by inquiry and direct tests in order to acquaint himself with new elements. He formulates hypotheses and verifies the cause-effect relationship on their basis.

   (d) **Organization of data:** Data are organized while gathering data. A teacher makes his students to infer from the gathered data and analyzes the inference.
(e) **Analysis of inquiry process:** In this, a student is asked to analyze the inquiry process. Also, it is also decided if all necessary data have been received or not. A teacher evaluates and reviews the entire process and makes an effort to arrive at the suitable inference.

3. **Social system:** In this model, a teacher leads and motivates students for inquiry and gives them opportunities for testing of conclusions. In this model, the roles of both teacher and student are important. Cooperation between teacher and student is held in open environment.

4. **Support system:** In this model, special practical tests are used for evaluation or support system. After the evaluation, it can be figured out—how far and how effectively a student has succeeded in doing his work.

**Characteristics of Inquiry Training Model**

The following are the characteristics of inquiry training model:

- It is more useful in scientific studies.
- It constructs the attitude of inquiry in students.
- It cultivates scientific attitude in students.
- The use of this model provides clear and practical knowledge to students.
- It cultivates ‘curios’ nature of students.
- It is used in every educational circumstance.

The model was developed for teaching of physical science, but this model has come to be used in the teaching of other subjects too. This has proved useful for teaching in all classes. However, all the topics of every subject cannot be taught by this model. It is used where a problematic situation is presented. This model has proved extremely useful in the development of mutual relations of students.

**Check Your Progress**

7. State the objective of inquiry training model.
8. How does a student gather data in inquiry training model?

**11.6 ADVANCE ORGANIZER TEACHING MODEL**

Advance organizer training model was designed by an American psychologist, David P. Ausubel. Advance organizer teaching model is an approach to expository teaching. The elements of advance organizer teaching model are as follows:

1. **Focus:** Its main purpose is to facilitate meaningful verbal learning and retention. It has two aspects. They are as follows:
   (a) The development of suitable teaching strategies to increase the clarity and stability of learning.
   (b) To facilitate a critical approach of the ideas in the cognitive structure.
2. **Syntax:** Syntax has two phases. They are as follows:
   (a) The presentation of the organizer, which should be at a more general level.
   (b) The presentation of material itself.

   The first organizer presents the material in a sequence of learning activities which are more meaningful, specific and original.

3. **Social system:** The teacher has to present the material in a meaningful sequence. It creates highly structured learning situation. The teacher’s exercises control the intellectual structure. It is essential the learning material should be related to the organizer. It helps students to discriminate new material from the earlier material.

4. **Support system:** The advance organizer depends upon an integral relationship between the conceptual organizer and the rest of the content. The crucial aspects of model are development of organizer and system of presentation. The structure of the material must be organized so that it relates to the organizer. This model is designed to organize face-to-face teaching.

5. **Classroom application:** It can be used for teaching every subject but it was developed to teach the verbal material rather than to develop skills and master problem-solving. It is a sensitive model of teaching because it depends upon the advance-organizer’s functioning as a conceptual linkage from the material for the learner. It is especially suited for written, verbal material for imparting knowledge of a subject-matter. It helps in developing conceptual structures and meaningful assimilation of information and ideas.

### Check Your Progress

9. State any one advantage of classroom application.
10. What are the two main phases of syntax?

### 11.7 JURISPRUDENTIAL TEACHING MODEL

Jurisprudential teaching model has been developed by scholars Donald Alive and James Shaver in their Harvard Social Studies Project. The main proponents of jurisprudential teaching model are as follows:

1. **Focus:** The main purpose of this model is to develop ability to solve the social problem on the basis of certain information and facts.

2. **Syntax:** Syntax of the jurisprudential teaching model comprises two phases. They are as follows:
   (a) In the first phase, problem is identified from social situation.
   (b) In the second phase, discussion is organized between teacher and students.
The dialogues help in diagnosing the problem and suggestion for solving it. The teacher ensures about intellectual climate in the discussion to have right operations.

3. **Social system:** First, the teacher begins before handing over the task to the students. The social climate is characterized by vigour but far from intimidating.

   A vigorous intellectual climate is maintained where all views are respected. Direct evaluation of students’ opinions is avoided and issues are thoroughly explored. The substance of students’ thinking is probed by questioning relevance and consistency.

4. **Support system:** The discussion should be based upon sources of some of the documents. Some other information supports may be used to explain the position of the problem. In the discussion some code and conduct maybe maintained.

5. **Application:** Oliver and Shaver have developed this model to improve students’ ability to analyse public issues and to clarify value position. The educators may consider this model to develop similar structure of discipline.

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**Check Your Progress**

1. What is the main purpose of jurisprudential teaching model?
2. How is a vigorous intellectual climate maintained in jurisprudential teaching model?

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**11.8 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS**

1. The two main sources of support system are as follows:
   (a) The role of specification for the teacher.
   (b) Requirements of the substantive nature i.e. experts and knowledge of the experts. Thus, the support system helps to generate desirable classroom environment.

2. According to professor Hyman, ‘the model is a way to talk and think about instruction in which certain facts may be organized, classified and interpreted.’

3. The important characteristics of social interaction model are as follows:
   (a) It focuses on the process by which reality is discovered by sociality.
   (b) It lays emphasis on the ability of an individual by which he improves his relations with others.
   (c) It lays emphasis on improvement of democratic activities and betterment of society.
4. Information processing indicates those types which an individual adopts to adapt stimuli from the environment, to understand problems for organizing the given material, to solve problems and to use verbal and non-verbal symbols.

5. The objective of the concept attainment model is to enhance the ability for inductive reasoning in students and to develop concepts in them.

6. The characteristics of concept attainment model are as follows:
   (a) It cannot be used for imparting knowledge of facts, for answering ‘why’ and to tell reasons.
   (b) It is very useful in language learning.
   (c) It makes an effort to teach fundamental principles of mathematics and science easily.
   (d) It proves to be more useful when it comes to subjects which provide more opportunities for concept formation.

7. The chief objective of inquiry training model is to develop cognitive skills in a child. A student analyses concepts logically through inquiry. It helps in the cultivation of scientific attitude.

8. A student gathers data in inquiry training model by inquiry and direct tests in order to acquaint himself with new elements. He formulates hypotheses and verifies the cause-effect relationship on their basis.

9. Classroom teaching helps in developing conceptual structures and meaningful assimilation of information and ideas.

10. The two main phases of syntax are as follows:
    (a) The presentation of the organizer, which should be at a more general level.
    (b) The presentation of material itself.

11. The main purpose of jurisprudential teaching model is to develop ability to solve the social problem on the basis of certain information and facts.

12. A vigorous intellectual climate is maintained in jurisprudential teaching model as all views are respected. Direct evaluation of students’ opinions is avoided and issues are thoroughly explored. The substance of students’ thinking is probed by questioning relevance and consistency.

11.9 SUMMARY

- A model can be defined as an object or a sample which can be reproduced. On the basis of this meaning, we can say that the teaching model is a sort of pattern of planning in which we select the instructional material after deciding the curriculum, and guide the functions of the teachers.
A number of eminent scholars have introduced different types of families of models of teaching. John P. Dececco, an American academic has classified models of teaching into four basic psychological classes or families.

The most widely accepted classification has been given by scholars Joyce and Weil. They have developed more than 20 models. These models have been divided into four chief families on the basis of their chief characteristics and nature.

Information processing model family lays emphasis on information-processing ability of students, and the system by which this ability can be enhanced.

Skill in teaching can be called as mastery over the models of teaching. When a teacher is skilled to effectively use these models, his skill is further enhanced. A good teacher constructs new models himself and tests them as he teaches his students.

Skinner’s principle, also called Operant Conditioning Law, is used in several fields, such as education and other fields ranging from military training to medical treatment.

Skill in teaching can be called as mastery over the models of teaching. When a teacher is skilled to effectively use these models, his skill is further enhanced. A good teacher constructs new models himself and tests them as he teaches his students.

The concept attainment model has been found useful in teaching most of the subjects. This model has proved useful at all levels of teaching as well.

‘A concept is a symbol that stands for a class or group of objects or events that possess common properties. Concepts greatly simplify our thinking processes. They make us free from having to level and categorize each new object or event we encounter.’

The objective of the concept attainment model is to enhance the ability for inductive reasoning in students and to develop concepts in them.

Dr Anand has expressed his views about construction of concepts in human beings and has said that Bruner and his associates believe that the environment in which a human being lives is so diverse and complex that he cannot understand them without classification.

The inquiry training model was developed in 1966. Renowned author and scholar, Richard Suchman believes that a child is curious by nature and the child feels joy when his question is answered.

The inquiry training model is based on scientific concept and scientific method which trains a student for scholarly inquiry. In this, students are given freedom to inquire, by which they are motivated to ask questions in a disciplined manner.
Advance organizer training model was designed by an American psychologist, David P. Ausubel. Advance organizer teaching model is an approach to expository teaching.

The advance organizer depends upon an integral relationship between the conceptual organizer and the rest of the content.

Jurisprudential teaching model has been developed by scholars Donald Alive and James Shaver in their Harvard Social Studies Project.

A vigorous intellectual climate is maintained in jurisprudential teaching model as all views are respected.

Oliver and Shaver have developed jurisprudential model to improve students’ ability to analyse public issues and to clarify value position. The educators may consider this model to develop similar structure of discipline.

11.10 KEY WORDS

- **Curriculum planning:** It refers to a process in which the curriculum is created.
- **Focus:** It refers to the goal or objective of teaching. The teaching activities are oriented to achieve some goals in life.
- **Model:** It refers to an object or a sample which can be reproduced.
- **Teaching method:** It refers to a method which comprises of all the principles and methods used for instruction.

11.11 SELF ASSESSMENT QUESTIONS AND EXERCISES

**Short Answer Questions**

1. What are the main assumptions of teaching model?
2. Name the three main teaching models.
3. Differentiate between personal models and behaviour modification models.
4. What are the steps involved in the syntax of concept attainment model?
5. List the main elements of inquiry training model.
6. Write a short note on jurisprudential teaching model.

**Long Answer Questions**

1. Discuss the fundamental elements of teaching method.
2. Explain the elements of concept attainment model.
3. Explain the various families of models of teaching given by noted authors Bruce R. Joyce and Marsha Weil.

4. What are the four families of models of teaching suggested by Dr. S.S. Mathur? Discuss in detail.

11.12 FURTHER READINGS


Development of models of teaching is one of the recent innovations in teaching. An important purpose of discussing models of teaching is to assist the teacher to have a wide range of approaches for creating a proper interactive environment for learning. An intelligent use of these approaches enables the teacher to adapt him to the learning needs of the students.

In this unit, the concept and advantages of role-playing have been discussed. The basis of inquiry training model and its merits and demerits have been explained. The unit will also analyse the basis of non-directive teaching model.

12.1 OBJECTIVES

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

- Analyse the meaning of role-playing
- Discuss the advantages of role-playing
- Interpret the assumptions of inquiry training model
- Describe the elements of information-processing model
- Explain the non-directive teaching model
12.2 THE SOCIAL INTERACTION (ROLE PLAY)

Role-playing is a teaching strategy that fits within the social family of models. These strategies emphasize the social nature of learning, and see cooperative behaviour as stimulating students both socially and intellectually. Role-playing is a teaching strategy which offers several advantages for teacher as well as the student.

First, student interest in the topic is raised. Research has shown that ‘integrating experiential learning activities in the classroom increases interest in the subject matter and understanding of course content’.

Secondly, there is increased involvement on the part of the students in a role-playing lesson. Students are not passive recipients of the instructor’s knowledge. Rather, they take an active part. It has been observed that true learning cannot take place when students are passive observers of the teaching process.

A third advantage to using role-playing as a teaching strategy is that it teaches empathy and understanding of different perspectives. A typical role-playing activity would have students taking on a role of a character, learning and acting as that individual would do in the typical setting. Researchers have found a significant increase among students in feeling another’s distress as their own.

In role-playing, the student is representing and experiencing a character known in everyday life. The use of role-playing emphasizes personal concerns, problems, behaviour, and active participation. It improves interpersonal skills, improves communication skills and enhances communication.

Check Your Progress

1. State any one use of role-playing.
2. Why are students not passive recipients of the instructor’s knowledge?

12.3 THE INFORMATION-PROCESSING MODEL (INQUIRY TRAINING)

The inquiry training model was built by theorist, J. Richard Suchman for developing scientific inquiry training skills in the students. This model is based on the following beliefs of Suchman.

1. All knowledge is tentative. A scientist generates a theory of principles. After some time it may be pushed aside by a new one.
2. Most of the problems are amenable to several equally plausible explanations. There is no one particular answer to a problem.
3. Inquiry is natural. All of us often inquire when confronted with a problematic situation or puzzle.
4. An individual can be made amenable to the process of inquiry. He can be made to learn to analyse his thinking strategies.

5. In addition to what is already known to an individual, he may be taught the new strategies to enquire and explore things.

6. The inquiry process is a cooperative effort. It is always facilitated by the ‘give and take’ of ideas from colleagues.

The elements of the information-processing model are as follows:

1. **Focus**: Children are curious by nature and this model attempts to satisfy their urge of curiosity by providing systematic training in inquiry.

2. **Syntax**: It consists of five phases as shown below:

   **Syntax of the Inquiry Training Model**

<table>
<thead>
<tr>
<th>Phase No.</th>
<th>Phase</th>
<th>Components/ Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase One</td>
<td>Encounter with the problem</td>
<td>1. Explaining inquiry procedures.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Presentation of the problem or puzzled event.</td>
</tr>
<tr>
<td>Phase Two</td>
<td>Data Gathering process (Verification)</td>
<td>1. Verifying the nature of objectives and conditions.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Verifying the occurrence of the problem.</td>
</tr>
<tr>
<td>Phase Three</td>
<td>Data Gathering Process (Experimentation)</td>
<td>1. Isolating relevant variables.</td>
</tr>
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<td></td>
<td></td>
<td>2. Hypothesizing and testing casual relationships.</td>
</tr>
<tr>
<td>Phase Four</td>
<td>Formulating an explanation</td>
<td>1. Formulating explanations or rules.</td>
</tr>
<tr>
<td>Phase Five</td>
<td>Analysis of the enquiry process</td>
<td>2. Analysing inquiry strategy and developing more effective ones.</td>
</tr>
</tbody>
</table>

3. **Principles of reactions**: According to Joyce and Weil (1978) the responding and reacting may be guided by the following:

   (a) Framing questions in such a way that the answers can be given in ‘yes’ or ‘no’.

   (b) Asking students to rephrase questions properly.

   (c) Pointing out unvalidated statements like, ‘We have not yet established that this is solid.’

   (d) Using the language of the inquiry process.
(e) Providing free intellectual environment to the students.
(f) Pressing students to make clear statements of their theories and more support for their generalisations.
(g) Encouraging interaction among students.

4. **Social system:** At every stage, the teacher is expected to respond in such a way as students may be encouraged to initiate and pursue the inquiry.

5. **Support system:** Both the students and the teachers need additional support. The teacher provides support to the students to develop material. He himself requires support in the form of a set of confronting materials, technical understanding of the intellectual processes and strategies of inquiry and resource material bearing on the problem.

6. **Application context:** The method is designed to provide training to solve the problem in a systematic way. As observed by theorists, Weil and Joyce, "The emphasis in this model is clearly on becoming aware of and mastering the enquiry process, not on the content and explanation of any particular problem situation. Although the model should also be enormously appealing and effective as a model of acquiring and using information, the teacher cannot be too concerned with subject matter coverage or correctness."

**Merits of Inquiry Teaching Model**

The following are the merits of inquiry teaching model:

- It helps in the development of imagination power of students.
- It gives training to analyse things systematically.
- It helps in the development of reasoning power.
- It provides a lot of training to students to put suitable questions.
- It imparts training to the students to go deep into the problem.
- It prepares the students for solving various problems of life systematically.
- It engages the continuous attention of the teacher as well as the students. Students hardly can afford to be absent minded.

**Limitations of Inquiry Teaching Model**

The model can work well only in the hands of very intelligent and resourceful teachers. An average teacher can hardly make use of this model. Shy students lag behind. It puts a lot of premium on the speaking ability of the students.

**Example Illustrating the Use of Enquiry Training Model (ETM) (History Lesson)**

It happened about a thousand years ago. A battle was fought between the armies of two kings. King 'A' had a very large army as compared with King 'B'. King 'B' himself commanded the army. His army included trained horses. There was a unit
NOTES

Interaction in the class to find out the reason of the defeat of King ’A’ may take the following form.

Student 1: Was the army of King ’A’ not adequately equipped with weapons.
Teacher: No
Student 2: Was the army not well-trained?
Teacher: No
Student 3: Were there dissentions in the army?
Teacher: No
Student 4: Was the food supply short?
Teacher: No
Student 5: Can the elephants fight on a rainy day with the same strength and tactics as on an ordinary day?
Teacher: No
Student 6: Can we compare the fighting spirit of the two armies—one commanded by a brave king and the other by a commander?
Teacher: Yes
Student 7: Will not the army commanded by a brave king show more zeal?
Teacher: Yes
Thus, in this way students can be given inquiry training.

Check Your Progress

3. Why is inquiry process considered as a cooperative effort?
4. What are the limitations of inquiry teaching model?

12.4 PERSONAL MODELS (NON-DIRECTIVE TEACHING)

The non-directive teaching model was developed by an American psychologist, Carl Rogers, who believed that positive relationships allows a person to grow and that instruction should be based on concepts of human relations. This approach changes the role of the teacher to facilitator. As facilitator, the teacher guides their
growth and development. The difference in this approach is that teacher and student basically form a partnership in learning. In this capacity, they can communicate more effectively and increase learning. This approach changes the focus from short-term objectives to long-term learning styles.

Rogers thought that responses to a problem should take into consideration the emotions of the student. Responding in just an intellectual way does not get to the root of the problem. Since we are human beings, this approach is sensitive to the needs of the student and will generate more student centered growth. This growth appears as the student releases feelings, develops insight, followed by action and integration that leads to a new orientation. There are different phases in the sequence of the non-directive model.

- Teacher encourages free expression of feelings.
- Students are encouraged to define the problem. Teacher accepts and clarifies feelings.
- Student discusses problem. Teacher supports student.
- Student plans initial decision-making. Teacher clarifies possible decisions.
- Student gains further insight and develops more positive actions. Teacher is supportive.

Check Your Progress
5. State the premise of non-directive model.
6. Name the psychologist who invented non-directive teaching model.

12.5 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS
1. Role playing improves interpersonal skills, improves communication skills and enhances communication.
2. Students are not passive recipients of the instructor’s knowledge. Rather, they take an active part. It has been observed that true learning cannot take place when students are passive observers of the teaching process.
3. The inquiry process is a cooperative effort because it is always facilitated by the 'give and take' of ideas from colleagues.
4. The inquiry teaching model can work well only in the hands of very intelligent and resourceful teachers. An average teacher can hardly make use of this model. Shy students lag behind. It puts a lot of premium on the speaking ability of the students.
5. The non-directive model believes that a positive relationship allows a person to grow and that instruction should be based on concepts of human relations. This approach changes the role of the teacher to facilitator. As facilitator, the teacher guides their growth and development.

6. The non-directive teaching model was developed by an American psychologist, Carl Rogers.

12.6 SUMMARY

- Role-playing is a teaching strategy that fits within the social family of models. These strategies emphasize the social nature of learning, and see cooperative behaviour as stimulating students both socially and intellectually.
- Role-playing is a teaching strategy which offers several advantages for teacher as well as the student.
- A typical role-playing activity would have students taking on a role of a character, learning and acting as that individual would do in the typical setting. Researchers have found a significant increase among students in feeling another’s distress as their own.
- In role-playing, the student is representing and experiencing a character known in everyday life. The use of role-playing emphasizes personal concerns, problems, behaviour, and active participation.
- The inquiry training model was built by theorist, J. Richard Suchman for developing scientific inquiry training skills in the students.
- Inquiry is natural. All of us often inquire when confronted with a problematic situation or puzzle.
- An individual can be made amenable to the process of inquiry. He can be made to learn to analyse his thinking strategies.
- The inquiry process is a cooperative effort. It is always facilitated by the ‘give and take’ of ideas from colleagues.
- Both the students and the teachers need additional support. The teacher provides support to the students to develop material.
- The non-directive teaching model was developed by an American psychologist, Carl Rogers, who believed that positive relationships allows a person to grow and that instruction should be based on concepts of human relations.
- Responding in just an intellectual way does not get to the root of the problem. Since we are human beings, this approach is sensitive to the needs of the student and will generate more student centered growth.
12.7 KEY WORDS

- **Integrating experiential learning activities**: It refers to activities which take place in the classroom to increase interest in the subject matter and understanding of course content.

- **Inquiry training model**: It refers to a training method which is used for giving training of inquiry to the student. By using this model in the classroom, inquiry skill can be developed.

- **Positive relationships**: It refers to type of relationships which allows a person to grow and that instruction should be based on concepts of human relations.

- **Role-playing**: It refers to a teaching strategy that fits within the social family of models. These strategies emphasize the social nature of learning, and see cooperative behaviour as stimulating students both socially and intellectually.

12.8 SELF ASSESSMENT QUESTIONS AND EXERCISES

**Short Answer Questions**

1. Why is inquiry process natural to humans?
2. What are the elements of information-processing model?
3. How is responding and reacting guided in inquiry training model?
4. State the premise of application context in inquiry training model.
5. What are the phases in the sequence of non-directive model?

**Long Answer Questions**

1. What are the main advantages of role playing? Discuss in detail.
2. Explain the assumptions of inquiry training model.
3. Analyse the five phases of syntax.
4. Describe the merits of inquiry teaching model.
5. Discuss the proponents of non-directive teaching model.

12.9 FURTHER READINGS


UNIT 13 INFORMATION AND COMMUNICATION TECHNOLOGY

Provision of learning with flexibility by overcoming the barriers of distance, time and money of the individual learners is known as open learning. The combination of both open and more restricted learning provided to the learners is known as distance education. The combination of open learning and distance education in which emphasis is on learning than teaching is open distance learning. In open distance education, communication is a very important aspect.

The media plays a vital role in distance education. The media creates a sense of belonging with the course instructors by making teaching less impersonal; reduce the time required by the learners to master the content through reading alone, promotes discussion between tutor and learners, between peer groups, model the behaviour that cannot be adequately communicated via the printed page such as collaborative learning, provides accessibility of the inaccessible by oral and visual presence of subject experts, establishes academic credibility of the courses and attracts new learners by the novelty of the media for example the world wide web.

In this unit, the meaning of information and communication technology, its importance and role in distance education have been discussed. The application of ICT in distance education and its advantages have been analysed. The unit will
also provide an in-depth knowledge about the different types of e-resources in distance education.

### 13.1 OBJECTIVES

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

- Discuss the meaning of information and communication technology (ICT)
- Analyse the importance of ICT in distance education
- Explain the development of ICT in the existing times
- Interpret the application of ICT in education
- Identify the advantages of ICT in distance education
- Discuss the different areas related to ICT in distance education
- Analyse the uses of different e-resources in distance education

### 13.2 INFORMATION COMMUNICATION TECHNOLOGY: MEANING, STAGES OF DEVELOPMENT AND PARADIGMS AND PRACTICES

In distance education, communication plays a crucial role. Choosing the right form of media is important in distance education. Media can be categorized based on the characteristics such as access characteristics and control characteristics. The types of symbols that a medium uses to represent and communicate the information are known as symbolic characteristics, for example- written languages, visual images, spoken words, and different types of figures. Print is a media which is a powerful combination of written symbols, words, numbers and a wide range of illustrations, charts, diagrams, tables and maps. The teachers can use this print material skilfully to make their teaching process easier.

The characteristics under access category refer to the extent to which teachers and learners are in a position to have accessibility and capability to use. There is a need to consider on the part of the planner about the knowledge and skills necessary to use a given media to allow active learning on the part of the learner and the degree to which the medium allows individual interaction between the teachers and learners. The ability of the learners and teachers to make use of and exercise individual influence and choice over the medium represents the control characteristics.

#### 13.2.1 Meaning: Information and Communication Technology (ICT)

Information and communication technology (ICT) can be roughly defined as a diverse set of technological tools and resources used to communicate, create,
disseminate, store, and manage information. Such technologies include print media, broadcasting technologies like radio and television, telephones, computers, and the Internet. The term ‘ICT’ is being used in academic discussion since 1980s, but it gained unprecedented popularity only in the recent times. This was marked by the increase in the worldwide interest in examining how computers and the Internet can be used to improve the efficiency and effectiveness of education in both formal and non-formal settings.

However, ICTs are more than just these technologies as older technologies such as the printed textbooks and telephone. Although given less attention now, such old technologies have a longer and richer history as instructional tools. For instance, by the time we find ourselves talking about the second generation of distance education, radio and television have been abundantly used in distance education. However, print still remains the cheapest, the most accessible and the most dominant delivery mechanism in the education system of both developed and developing countries.

While discussing the meaning of ICT, we also find that different technologies are typically used in combination rather than as the sole delivery mechanism to enhance the effectiveness of their use. For instance, if we take the example of the Kothmale Community Radio Internet in Sri Lanka, we find that radio broadcasts as well as computer and the Internet technologies are utilized by it to facilitate information sharing and avail better opportunities in the field of education a Sri Lankan rural community. The Open University of the United Kingdom (UKOU), which happens to be world’s first educational institution, is completely dedicated to open and distance learning (ODL). To a great extent, the UKOU is still dependent on print-based materials supplemented by radio and television. Recently, they have also introduced online programmes to facilitate effective learning. The secret of the success of UKOU lies in clearly identifying the needs of learners, providing a strong learner support service; and combining conventionally taught components with the use of latest technologies including videotapes, audiotapes, and television. Similarly, the Indira Gandhi National Open University (IGNOU) combines the use of print, recorded audio and video, broadcast radio and television, and audio conferencing technologies as tools of education.

The importance of ICTs and its growing use in educational fields, the contemporary learners are no longer isolated but are actually connected with each other and also with their teachers in an electronically supported community. The use of ICTs in both school and higher education has developed greater self-direction and motivation in the learners. This has helped them move away from teacher-centric approach to self-learning approach. Instead of receiving information or knowledge from the teacher who is traditionally seen as the ‘knowledge bank’, students can now derive information at anytime from anywhere and develop their understanding of the course-content without any external help with the use of ICTs.
In the context of the 21st century, the digital revolution in Information and Communication Technology has moved into the homes and private lives of ordinary people. Unsurprisingly, the lives of the people around the world have become increasingly shaped and mediated by information and communication technologies. Called the ‘Net Generation’, these people are making themselves a part of what the United Nations has roughly called ‘an unprecedented and global media culture’. But, in a developing country like India, the use of computers and the Internet is yet to gain momentum in the remote areas because of limited infrastructure and the heavy costing for accessibility. Hence, still there is a scope of discussing the usefulness of ICTs and their applicability in diverse situations.

13.2.2 Stages of Growth and Development of Information and Communication Technology (ICTs)

Communication is fundamental to the human civilization for a society can function only when communication is made possible among the members of the society. In ancient times, human beings communicated through writings on stone or wood that limited the resultant communication to a small area. But, along with the advancement of civilization, other means of communication were also tried and invented. For example, the invention of the printing press revolutionized the processes of communication to a larger group. However, it took a lot of time to transform our society from symbols, gestures, signals to printed forms of communication system.

With the emergence of the digital age, communication technologies re-emerged with a new name—Information and Communication Technologies or ICTs to transform the human society like never before. Today, we have the most sophisticated processes of communication, both in print and non-print forms, which have enabled increased ability to share experiences and information with each other in a much productive manner. The non-print communication technologies mainly include important media components such as audio, video, telecommunication and multimedia communication. Subsequently, more emphasis is laid on the manufacture, storage, processing, editing and transmitting of information to be used by everyone as and when necessary. So, with the advancement of ICTs, human beings have moved towards an information-based or knowledge-based society.

The following are some of the important stages in the growth and development of information and communication technologies as we find them today.

1. Print media: The growth of modern communication technology begins with the emergence of the print media. The important point is that even in the contemporary age of computers and satellite communication system, print materials have not lost their importance as a tool of communication. In ancient periods, written words had to be copied by hand, and consequently, the circulation of books was limited to a privileged few. Around 1400, the printing press was invented in Europe
and that changed the whole world. John Guttenberg of Germany played a significant role in starting mass printing. Today print medium is used in newspapers, journals, pamphlets, handbooks, textbooks, dictionaries, and encyclopaedia and so on. Although it has faced lot of challenges in a digitally transformed world, Print media will never lose its importance as a means of communication.

2. **Audio media**: The radio is a comparatively recent invention. However, its growth took place mainly around 1920s and 1940s. Since then, radio has transformed Indian society like never before. With the development of new broadcasting facilities such as FM Radio, audio media has established itself as a powerful tool for entertainment as well as information. The use of radio for education was a later development. For accessing a large number of persons at the same time, radio was realized to be a potential medium for enhancing and exchanging knowledge. Apart from radio, the development of technologies like gramophone records and cassettes can be seen as the most popular and easily accessible medium for the public. Although used mostly for entertainment, the audio tape has tremendous educational value. However, the idea of audio media has been given another boon with the invention of Compact Disk (CD) and Digital Versatile Disk (DVD) as they give better voice and sound quality.

3. **Audio-visual media**: Along with the radio, there emerged television in the late 19th century and early 20th century. Subsequently, audio-visual technologies rapidly expanded all over the world. This technology that began with broadcast television mainly in the developed first world countries now embraces video cassettes, cable TV, computers, video texts and video discs. The reach of TV is also increasing as both the public and the private providers are offering programmes of all kinds according to the requirements of the target audience. It was on the basis of the effectiveness of the audio-visual media that it began to be used in a large scale for educational purpose.

4. **Telecommunication**: Telecommunication technologies began with the transmission of telegraphic signals over wires. With the invention of Graham Bell’s telephone set in 1876, telephone or long distance voice transmission became a popular word. The invention of fax machine further intensified the processes of exchanging communication. The latest avatar of telephone is the mobile phones. This mobile technology which started as a medium to transmit audio at a distance can now transmit full media such as audio, video, picture and text. The latest invention of 2G and 3G technologies have changed the entire experience of mobile telephony and the Internet connectivity.

5. **Multimedia communication**: Multimedia communication is a type of media and content utilizing a combination of different forms of
As the term itself suggests, multimedia is used in contrast to the traditional idea of media that makes use of only traditional forms of handwritten or printed material. It includes a combination of text, audio, still images, animation, video, and other interactive contents. Multimedia is usually recorded and played, displayed or accessed by information content processing devices. It can also play a significant role in a live performance. The emergence of satellite technologies, Internet and Intranet technologies in 1990s has changed the ways of exchanging information in the recent times. Consequently, multimedia technologies have tremendous potential as means of exchanging educational content.

6. **World Wide Web**: The most noticeable revolution initiated by the ICTs is the creation of the World Wide Web (WWW) and its potentials discovered in the early 1990s. In these last two decades, WWW technologies have become the driving force in the field of technology allowing people across the globe to communicate and exchange information. This had led to the creation of a totally new dimension which we know as the ‘virtual world’. Nowadays, almost all organizations, irrespective of their types and sizes, have managed to utilize the web-enabled technologies for conducting not only information processing but also dissemination with their prospective clients, suppliers, students and governments. Regardless of their geographic location, these technologies allow instant access to information for people, leading to complete realization of the information age.

**Teleconferencing** refers to ‘interactive electronic communication among people located at two or more different places’. In open and distance learning, teleconferencing has been a useful tool for providing direct instruction and learner support.

There are four types of teleconferencing techniques based on the nature and extent of interactivity and the sophistication of the technology:

1. **Audio conferencing**: It involves the live exchange of voice messages over a telephone network.
2. **Audio-graphic conferencing**: It involves the exchange of text and still images such as graphs, diagrams or pictures along with voice messages.
3. **Videoconferencing**: It allows the exchange of voice and graphics along with moving images. Videoconferencing uses either a satellite link or television network.
4. **Web-based conferencing**: It includes the transmission of graphic, text, audio-visual media by the means of the Internet. A computer with a browser is a prerequisite in web-based conferencing; and communication can be either synchronous or asynchronous.
13.2.3 ICT Paradigms and Practices

Perhaps the most important point to remember while using technologies for educational purpose is to see if the resources of ICTs are actually used according to the requirements of different target audience. It means that the proper use and application of ICTs can still be considered a serious issue.

There are two possible ways to see the application of ICTs in Indian society. ICTs have given us various efficient and worthwhile tools of communication. It has, at the same time, also widened and enlarged the horizon of human beings. The application of ICTs in education can be briefly understood in terms of the following two points: (i) access and (ii) teaching-learning.

1. **Access**: The desire to access more and more people at the same time has made human beings invent ways of faster communication processes. Thanks to modern communication technologies, it is now possible to reach out to a large number of people effectively in no time. For example, with the help of transmission networks and satellite-based communication systems, a large section of the population can be accessed. Telephones, fax machines, mobile phones, and computers have brought new technologies to access people. Now a huge amount of information can be stored and exchanged with a mouse click.

   However, the latest trends in teleconferencing which includes audio conferencing, video conferencing and computer conferencing have made the application of ICTs much more productive and efficient. Subsequently, there emerged various other technologies to suit the requirements of the content being used for teaching. However, the idea of access has changed drastically with the development of the Internet and the World Wide Web. Electronic mail or e-mail is cheap and instantaneous and has become the order of the day. Of late, Web 2.0 technologies have greatly transformed the educational environment with various tools such as Blogs, Wikis and Rich Site Summary (RSS), as student support services irrespective of the mode in which one is conducting the teaching.

   Nowadays, E-portals and Social Networking Sites within the educational institutions are gaining tremendous popularity in bringing together all those concerned with a meaningful educational interaction.

2. **Teaching-learning**: In a conventional face-to-face education system, education was considered to be a one-man show played by the teacher. Moreover, it was a general belief that learning takes place only within the four walls of a classroom set-up. But now because of the ICTs, this proposition does not fit into the present context of teaching-learning. The emergence of distance education has proved that learning can be made available anytime and anywhere. Communication technologies have replaced both the teacher and the textbooks, and have made teaching-
learning an enjoyable activity by placing the learners at their own in the learning process.

The distance education systems all over the world have responded positively and quickly to the revolution in ICTs. This has happened mainly because of three reasons:

1. ICTs have reduced the cost of education.
2. ICTs have enabled a large number of learners to enroll in need-based educational programmes.
3. ICTs have reduced the time required for introducing newer programmes of studies by adopting new flexible means.

For example, video conferencing facilities are developed to enable isolated learners to share learning with others in remote areas. Also, the ICT-enabled support services include the pre-admission counselling, admission process, delivery of study materials (both in print media and audio visual forms), provision for subject specific academic counselling, audio-visual viewing facilities, and participation in teleconferencing and ICT-based e-learning. Very Small Aperture Terminal (VSAT) satellite systems happen to be powerful distribution mechanism for Internet based resources, with ready access to interactive learning tools and e-mail.

In India too, Indira Gandhi National Open University (IGNOU) provides multi-channel, multiple media teaching-learning packages for instruction and self-learning. The different components used for teaching/learning include self-instructional print and audio-video materials, radio and television broadcasts, face-to-face counselling/tutoring, laboratory and hands-on experience, teleconferencing, video conferencing, interactive radio counselling, interactive multimedia CD-ROM and the Internet-based learning, and the use of mobile phones for instant messaging. The university is developing interactive multimedia content and learner support through video-conferencing and web-based platforms by utilizing both the EDUSAT and the Internet. Other than these, the Electronic Media Production Centre (EMPC) in the IGNOU campus is entrusted with the task of production of audio and video educational programmes. EMPC coordinates the educational radio and television channels such as Gyan Darshan, a fully digital 24-hour exclusive Educational TV channel, Gyan Vani, a unique low cost, interactive medium for enhancing and supplementing the teaching–learning process. The example of IGNOU shows that the application of ICTs is really effective in enhancing the learners support services above the conventional means and methods of learning.

While discussing the application of ICTs in distance education, we need to refer to the tools that are largely used for educational purpose. These tools may be either synchronous or asynchronous. While using the synchronous tools, teachers and learners are not connected to each other in real time: for example, send an email and the receiver can respond later. On the other hand, while using asynchronous tools teachers and students are connected to each other in real time and world: for example, chat sessions or Skype broadcast.
Some of the Web enabled tools that have gained much popularity of late are as follows:

- Dropbox (https://www.dropbox.com/)
- Moodle (http://moodle.org/)
- WordPress (http://wordpress.com/)
- GeoGebra (http://geogebr.org/)
- FrontlineSMS (http://www.frontlinesms.com/)
- Audacity (http://audacity.sourceforge.net/)
- Joomla (http://www.joomla.org/)
- Wiki (http://en.wikipedia.org/wiki/Main_Page)
- Blackboard Collaborate (http://www.blackboard.com/)
- Photostory (http://www.microsoft.com/windowsxp/using
digitalphotography/photostory/default.mspx)

Role of Information and Communication Technologies (ICTs) in Distance Education

Information and Communication Technologies (ICTs) have offered the developing countries multifarious opportunities to enhance educational systems, improve policy formulation and execution, and widen the range of opportunities for all, especially the unreached. However, as already pointed out, the benefits of ICTs can be best seen through its use in distance education. Distance education is a type of formal education in which the majority of the instruction, which is transmitted through technology, occurs when student and instructor are not in the same place.

The Commonwealth of Learning (COL) also defines distance education as, ‘a way of providing learning opportunities that is characterized by the separation of teacher and learner in time or place, or both time and place; learning that is certified in some way by an institution or agency; the use of a variety of media, including print and electronic; two-way communications that allow learners and tutors to interact; the possibility of occasional face-to-face meetings; and a specialized division of labour in the production and delivery of courses.’

It means that both ICTs and the ODL mode of education should adopt an integrated approach to enhance a more meaningful teaching-learning experience. In the following subsections, you will get to read more about the role and use of ICTs in distance education.

Advantages of Information and Communication Technologies (ICTs)

The advantages of Information and Communication Technologies (ICTs) can be understood through the following:

1. Anytime, anywhere and anyhow: One of the main features of ICTs is the ability to go beyond time and space. ICTs make space for
asynchronous learning which is generally characterized by a time lag between the delivery of instruction and its reception by the targeted learners. For example, Online Learning and E-Learning facilities provide course materials that may be accessed online 24 hours a day, 7 days a week. ICT-based educational delivery also dispenses with the need for a physical location for interaction to take place. Of late, teleconferencing and video conferencing technologies have enabled instruction to be received simultaneously by multiple, geographically dispersed learners. Thus, by using ICTs, it is possible to ensure global learning of education.

2. Access to remote learning resources: With the introduction of ICTs, teachers and learners need not anymore rely only on printed books and other kinds of study materials for fulfilling their educational requirements. A good amount of information can be shared/accessed on any and every subject, from anywhere and at anytime of the day, through the use of the Internet and the World Wide Web. This has gained tremendous popularity in the educational institutions of both the developed and the developing countries. ICTs also have facilitated access to resource personnel, mentors, specialists, researchers, professionals, business leaders, and peers across the globe.

3. Learner-centered learning environment: Appropriate use of ICTs has brought in a paradigm shift in both the pedagogical aspect of teaching and content delivery of contemporary education. When used appropriately, computers and the Internet technologies enable new ways of teaching and learning, rather than simply allow teachers and students to do what they have done before in a better way. These new ways of teaching and learning have constituted a shift from a teacher-centered pedagogy, characterized more by rote learning, to one that is fully learner-centered.

4. Expansion in the pool of teachers and students: In the past, the role of teachers in an educational institution was one of a highly qualified people. With technology-facilitated learning, there emerged opportunities to extend the teaching pool beyond the specialist to include many more people interested in imparting knowledge and information. The changing role of the teacher has thus increased the opportunities for people like workplace trainers, mentors, specialists and others, to participate in the teaching–learning process. Similarly in the past, education had been a privilege and an opportunity only for a selected few. But through the various flexibilities provided by technology-aided education, many students who previously were unable to participate in educational activities are now finding opportunities to do so. It is important to note that opportunities are now being provided to the students who are studying for a formal higher degree, irrespective of their backgrounds, and also
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to the students of the worker community who are undertaking various vocational courses sitting at their homes by means of computers and laptops.

**ICT-Based Learning: Different Evolving Areas**

In today’s context, there is no doubt about the fact that ICTs are potentially powerful tools for extending educational opportunities to the marginalized groups. These groups include ethnic minorities—girls and women, disabled persons, elderly people—who are traditionally excluded from formal education due to cultural or social reasons. Following the usefulness of ICTs, various buzzwords in the education sector have been introduced all over the world. These are as follows:

1. **Active learning**: Learners learn in the process of doing and working on real-life issues, thus making learning more relevant and less abstract to these learners’ requirement and real-life situations. This is how the ICT-enhanced learning promotes enhanced learner engagement in the teaching–learning process. It is also to be noted that ICT-enhanced learning is also ‘just-in-time or JIT’ learning, where the learners can make a selection on what they would like to and need to learn.

2. **Distributed learning**: A learning environment where participants are not co-located and use computer-based technologies to access instruction and communicate with others.

3. **Collaborative learning**: ICT-supported learning promotes communication, and collaboration among teachers, students and subject experts, no matter wherever they are located. It provides learners the opportunity to work with people from different cultures, thereby helping to enhance learners’ communicative skills as well as their global awareness. For example, Collaborative Learning on-Demand (CLOD) is a virtual collaborative learning paradigm which enables a self-tutored, interactive and cooperative learning process where a small group of remote students requests, watches and controls the playback of an archived lecture by exchanging questions with each other (Fortino and Nigro, 2003).

4. **Creative learning**: ICT-supported learning encourages the manipulation of accessible information and the formation of real-life products rather than only re-producing the received information.

5. **Integrated learning**: ICT-enhanced learning encourages a thematic and integrated approach to teaching-learning process. This learning approach removes the artificial division among the various disciplines, and between the theoretical and practical aspects that characterize a conventional classroom approach.

6. **Evaluative learning**: ICT-enhanced learning is student-oriented in approach. Unlike the static, text or print-based educational technologies,
ICT-enhanced learning distinguishes that many kinds of learning pathways and articulations of knowledge are present. ICTs permit the learners to explore and assess their own learning rather than merely listen and remember.

7. **E-learning/Online learning/Web-based learning:** Though generally associated with higher education and corporate training, online learning, e-learning and web-based learning include learning at all levels, both formal and non-formal. Such learning utilizes information networks—the Internet, an intranet (LAN) or extranet (WAN)—either wholly or partially, for the sake of course delivery, communication and facilitation.

8. **Blended learning:** When defined broadly, blended learning is the integration of classroom face-to-face learning with online or technology-aided learning, including a range of pedagogical approaches and delivery systems. Strategic applications of blended learning have shown achievement of learning gains while tackling other problems faced by Indian universities, most notably the pressures of increasing class sizes, and limitations in funding, classroom space, and learning support.

9. **M-learning:** The term ‘M-learning’, or ‘mobile learning’, primarily focuses on learning across contexts and learning with mobile devices. Mobile learning is defined as, ‘any sort of learning that takes place when the learner is not at a fixed, predetermined location, or learning that takes place when the learner takes advantage of the learning opportunities offered by mobile technologies’. M-learning also means learning with portable technologies such as MP3 players, notebooks and mobile phones. It focuses on the mobility of the learner, interacting with portable technologies, and learning that reflects a focus on how society and its institutions can accommodate and support an increasingly mobile population. Mobile devices have the potential to make a significant contribution to the implementation of the educational policies undertaken by various governments. However, this potential is not currently being realized. This seems likely to be due in part to the fact that while different types of mobile device meet different educational circumstances, each of them suffers from a number of limitations.

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**Exhibit 13.1 Community Radio**

Community radio is a type of service that offers radio broadcasting through community stations, which serve geographic communities and communities of interest. It broadcasts relevant and popular content to a local/specific audience, which may often be overlooked by commercial or mass-media broadcasters. Community radio stations are operated, owned and driven by the communities they serve. Community radio is not-for-profit system and provides a mechanism for facilitating individuals, groups and communities to tell their own diverse stories, to share experiences, and in a media-rich world to become active creators and contributors of media.
Community radio has developed differently in different countries and thus the term has somewhat different meanings in the United Kingdom, Ireland, the United States, Canada and Australia. Even in India, more than 300 community radio stations have been established. Community radio has also proved to be an important means of imparting education. We should know that the first community radio service in North-East India has been established under the auspices of KKH State Open University (Guwahati)—‘Jnan Taranga’. This is followed by ‘Radio Luit’, the second community radio of the North-East established by Gauhati University under the Institute of Distance and Open Learning.

Challenges of Information and Communication Technologies (ICT) in Educational Use

Despite its unprecedented growth, ICTs still remain a tool for the privileged, and access to it is not the norm throughout the world. It is still the case that on a global scale, very few learners actually have access to ICTs. Some of the challenges that we are facing can be seen in terms of the following pointers:

- How do we bring ICT to those who have no access to it yet?
- For those who do have access to ICT, do we have a mechanism to find out how are they using it?
- Given the ever-present nature of ICT in the lives of many contemporary learners, it seems critical to ask whether it really has an effect on the intellectual, emotional and physical development of learners.
- Do the learners have the intellectual skills needed to safely and effectively use ICT? If not, what should be the focus of intervention?
- The Internet is a primary source of information for online learners, and yet we are only just beginning to understand how they use it to look for information. How do learners use ICTs to fulfill their information needs?

Taking these pointers in mind, we can certainly argue that there are two obvious challenges while using ICTs—one, how to bridge the gap between those who have access to technology and those who do not have; and two, how to ascertain if ICTs have been effectively used. Because of such challenges, the introduction and integration of ICTs at different levels and in various types of education will be the most challenging undertaking. The failure to meet the challenge would mean a further widening of the gap and the increasing of existing economic and social inequalities between the rich and the poor. However, it is commonly accepted that there are four major challenges that an educational institute must try to cope with while introducing ICTs. Let us have a closer look at them.

- **Effectiveness:** However, effective ICTs are, this basically depends on how and to what use the ICTs are put. Also, ICTs may not function for everyone, and in every place, in a similar manner as a mode of educational delivery. Therefore, one of the most complex issues while
assessing the effectiveness of ICTs is that of standardized tests, which cannot capture the different types of benefits expected to be derived in a learner-centered environment. It is to be noted that the influence of educational radio and television broadcasts on the quality of basic education even today remains an under-researched area.

- **Cost:** Broadly speaking, ICT enhanced teaching–learning processes is more expensive. For example, educational television broadcasts and computer-based online-learning programmes are more costly when compared to radio broadcasts. Heavy expenses are barring the developing countries to make a meaningful shift towards ICT-enhanced learning. Although attempts have been made to make ICTs cost effective, we cannot say for sure if the cost can be reduced to suit various educational institutes of the developing countries.

- **Equity:** Given the wide disparities between rich and poor countries and between different groups in gaining access to ICTs, it is argued that the use of ICTs in education will widen the existing divisions among the people. This will also intensify economic, social, cultural, geographic and gender-related problems. So, the use of ICTs in education, when done without careful considerations, may result in the further marginalization of those who are already disadvantaged or underprivileged. For example, women have less access to ICTs and fewer opportunities for ICT-related training compared to men mainly because of illiteracy and lack of education and mobility. Due attention needs to be paid in order to ensure that the technology is in fact being used by the target learners.

- **Sustainability:** There is no one-to-one formula for determining the success rate of ICTs integration in the educational system. The various challenges that policymakers and planners, educators, education administrators and other stakeholders need to consider include educational policy and planning, infrastructure, language and content development, capacity building, and financing. Attempts to enhance and reform education through ICTs require clear and specific objectives, guidelines and time-bound targets, the mobilization of required resources and the commitment at all levels to see the initiative begin.

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**Check Your Progress**

1. What are the forms of non-print communication technologies?
2. How are synchronous tools different from asynchronous tools?
3. State one distinct feature of ICT.
13.3 UTILIZATION OF VARIOUS E-RESOURCES IN EDUCATION

The age of computers is dawning in schools. It is taking over the world swiftly and surely. It is quite a jump from traditional teaching-reliance on textbooks to the use of computers. Computers serve a dual purpose. They expose students to modern technology while inculcating in them a new and scientific approach to learning.

Broadly speaking, computers in education are used for the following:

- Instructional purposes
- Curriculum development
- Educational administration and management
- Educational planning
- Educational documentation
- Educational test construction
- Scoring and processing of examination results
- Educational research
- Educational surveys

Computers as an Aid to Learning

As observed in Computer-Based Training- Vol. 12 (1987), “The computer’s ability to perform logical operations is a major characteristic and must surely be central to any computer application. In the context of learning, the rapid response to a learner’s action is of particular benefit as there can be quick reinforcement of good ideas which the learner has and any misconceptions may be corrected. Many motor skills can only be learnt by direct use of the equipment concerned.”

13.3.1 Educational Implications of Computers

Computers may aid the learning process in the following ways:

- By providing information and instructions.
- By asking questions.
- By being tirelessly repetitive.
- By stimulating processes.
- By selecting the right speed for providing information for individual learners.
- By providing opportunities to try different things.
- By displaying data dynamically.
- By sparing us from doing tedious calculations ourselves.
- By doing difficult calculations.
By providing information from a vast store of knowledge.

By letting us check how well a learner understands a topic, by means of a computer.

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Four Focal Areas of Computer Management Support (CMS) to Teachers

The four areas of computer management support to teachers are as under:

1. Constructing, scoring and analysing tests.
2. Keeping records of students’ performance and progress through courses.
3. Providing guidance to the students and advising them on the choice of next course module.
4. Reporting on the performance and progress of students to individual students, tutors and educational administrators of the institutions.

The basic objective of CML (Computer Managed Learning) is to relieve the teacher from these tedious time-consuming tasks so that he can more profitably utilize his time and energy for instructional work. Here the teacher, the students and the computer work in close coordination, each doing the tasks most suitable to him/her. The teacher prepares course materials, teaches and helps the students in their learning. The student learns through course materials selected to suit his/her individual needs. The computer processes information quickly and accurately and maintains records. A general model of computer managed learning showing the roles of the student, the computer and the teacher is shown in the figure.

13.3.2 Specific Uses of Computers in Education

The uses of computers in education are as follows:

1. Computers’ Educational Aims: The following are the educational aims:
   - Computers motivate students to achieve these aims in an optimal manner.
   - Computers provide meaningful experiences to students to achieve aims.
   - Computers assist goal attainment by stressing sequential learnings.
   - Computers assist in the formation of realistic goals.
   - Computers assist in the realization of goals by stimulating feeling of success.
   - Computers assist in the achievement of goals by providing appropriate material for students of diverse capacity and achievement levels.

2. Use of Computer in Drill for Reinforcement of Learning: Computer-assisted instruction (CAI) has a variety of software to facilitate teaching-learning situations. Drill may be stressed. Students need practice to review/embed what has been learned, otherwise retention may not last long.
Repetition for the sake of repetition is not recommended. Software emphasizing drill material should be selected very carefully. Only relevant material should be chosen for drill purposes for the use of the learners. A computer does not tire of presenting drill experiences to learners. Nor does a computer become frustrated and rude. For correct responses provided by students to programmed drill items, a smiling face appearing on the screen of the computer can indeed personalize learning.

3. **Use of Computer-assisted instruction (CAI) in New Learning**: The fourth factor in emphasizing CAI might well be new learnings to be acquired by students. Each student using a computer terminal may experience programmed instruction. With programmed learning, a learner may read a few statements or see a demonstration on the screen of the computer. The student, in turn, responds to a multiple-choice or completion item based on what was comprehended from the sentences read or demonstration experienced. After he responds, the computer screen may show a smiling face if the response given was correct. If incorrect, the involved student may try again to respond correctly. If a second wrong response was given, the correct answer is provided on the screen. The successful learner in each response given is ready to progress to the next linear item. The student responding incorrectly also is ready for the next sequential item, after seeing the correct response on the screen. ‘Read’, ‘Respond’, and ‘Check’ are concepts emphasized again and again in sequential programmed items. New learnings, not drill and practice, are being emphasized.

4. **Computer Learning Based on Individual Needs**: Each student can achieve individually his/her own unique optimal level of achievement. No student needs to wait to have other learners progress at a similar level of achievement. Learners may individually progress as rapidly as personal capabilities permit using computer terminals.

5. **Computer-Learning and Problem Solving**: CAI may also provide problem solving experiences for students. Thus, a problem is presented on the screen of the microcomputer. The student using keys on the micro computer types a related decision. Feedback on the screen is provided to the learner relating to the typed decision. A new problem is then presented directly related to feedback to the involved learner regarding the previously made decision. Again, the student types a choice to be made involving, perhaps, four alternatives in a multiple-choice item. Feedback is again provided to the student on the quality of decision made, as well as new sequential problem presented on the screen. Figure 13.1 shows computer-learning and problem solving process.
6. Microcomputers in the Reading Curriculum: Author, Marlow Edger thinks that there are numerous means of utilising personal computers in teaching students in the area of reading. Tutorial programmes provide pupils with new learnings. Thus a programme might emphasize each of the following uses in terms of developing word attack skills:

- Phonics in assisting learners to associate sound with symbols.
- Syllabication in guiding pupils to divide words into syllables and thus unlock unknown words.
- Structural analysis in which students learn to divide words into prefixes, suffixes and root words.
- Configuration clues whereby learners perceive shape or form of specific words for identification purposes.
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- Picture clues whereby a picture provides the clue to the identification of unknown words.
- Context clues in helping students to identify a word within the confines of a sentence. The unknown word must make sense with other words contained in the sentence.
- Additional uses for microcomputers include drill and practice, as well as simulations and games.

Theorist, Wright and Forcier listed the following criteria for software selection for drill and practice as well as simulations and games:

<table>
<thead>
<tr>
<th>Criteria for drill and practice programmes</th>
<th>Criteria for simulations and games</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Format is interactive</td>
<td>1. Clear direction.</td>
</tr>
<tr>
<td>2. User can establish the pace.</td>
<td>2. Simple keyboard paddle use.</td>
</tr>
<tr>
<td>3. Provision made for progression in levels of difficulty.</td>
<td>3. Varying levels of difficulty.</td>
</tr>
<tr>
<td>4. Items at same level of difficulty can be selected at random.</td>
<td>4. Realistic situation for role-playing.</td>
</tr>
<tr>
<td>5. Employs motivational techniques.</td>
<td>5. High level of interest maintained throughout.</td>
</tr>
<tr>
<td>6. Rewards presented for correct responses.</td>
<td>6. Results predicated on user input.</td>
</tr>
<tr>
<td>7. Incorrect responses handled appropriately.</td>
<td></td>
</tr>
<tr>
<td>8. Teacher can modify content.</td>
<td></td>
</tr>
</tbody>
</table>

Functions of the School Administration and the Teacher in Using Computers in Education

The following are the functions of the school administration and teacher in using computers in education:

- New functions of the teacher will depend upon the specific purpose for which the computer is used.
- A technical expert should be consulted in the selection and purchase of hardware.
- An agreement should be made with the suppliers for supply and installation of the computer.
- One or two persons of the school should be trained in operation and servicing of the computer.
- A small centrally located room should be selected for the installation of the computer.
- Storage space should be provided for software programmes.
- A teacher called as ‘computer manager’ or ‘computer resources person’ shall be the overall in-charge of the computer. He will coordinate the entire work in this regard.
In CAL, the teacher has the chance to use new tools which will enhance his individual satisfaction and increase his efficiency.

The teacher will be liberated from his routine duty.

The teacher will be in a position to produce elaborate graphs and tables.

The teacher can compute accurately and rapidly huge data.

Computers can never be a threat to teachers. The computer is after all a tool itself, incapable (so far) of independent action. It has no inborn wisdom. It carries out the instructions given to it at incredible speed. It stores the data and gives it back when called upon to do so, in split seconds. Nevertheless, instructions have to be given to it by teachers. The computer therefore is a medium or tool in the teaching/learning process. It is the teacher who decides which part of the curriculum the computer can handle. It can be the flashing of a piece of text with blanks for missing information by way of a teaching tactic; or a multiple choice question with alternatives on the display screen for testing and recording a student’s score.

Developing Competence of Teachers and School in using Microcomputers

For achieving proficiency in computer usage, the following means may be utilized:

- Organizing workshops stressing relevant objectives.
- Conducting faculty meetings containing vital agenda items.
- Arranging video tape presentations on model procedures in computer usage.
- Showing slides, film strips, and films presenting sequential significant content.
- Planning talks by qualified resource personnel to participants on curriculum and uses of the computer.
- Visiting classrooms in which effective computer usage is being stressed.

In-service education for teachers and administrators in microcomputer use in the curriculum should:

- Provide new learnings sequentially.
- Emphasize utilitarian values in teaching and learning situations.
- Stress meaningful, understandable content.
- Inculcate purpose or reasons for learning.

Check Your Progress

4. State the basic objective of Computer Managed Learning (CML).

5. How is the curriculum of in-service education designed?
13.4 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. The non-print communication technologies mainly include important media components such as audio, video, telecommunication and multimedia communication.

2. While using the synchronous tools, teachers and learners are not connected to each other in real time: for example, send an email and the receiver can respond later. On the other hand, while using asynchronous tools teachers and students are connected to each other in real time and world: for example, chat sessions or Skype broadcast.

3. One of the main features of ICT is the ability to go beyond time and space. ICTs make space for asynchronous learning which is generally characterized by a time lag between the delivery of instruction and its reception by the targeted learners.

4. The basic objective of Computer Managed Learning (CML) is to relieve the teacher from these tedious time-consuming tasks so that he can more profitably utilize his time and energy for instructional work.

5. In-service education for teachers and administrators in microcomputer should keep in mind the following points while designing the curriculum:
   a) Provide new learnings sequentially.
   b) Emphasize utilitarian values in teaching and learning situations.
   c) Stress meaningful, understandable content.
   d) Inculcate purpose or reasons for learning.

13.5 SUMMARY

- In distance education, communication plays a crucial role. Choosing the right form of media is important in distance education.
- Media can be categorized based on the characteristics such as access characteristics and control characteristics.
- The characteristics under access category refer to the extent to which teachers and learners are in a position to have accessibility and capability to use.
- Information and communication technology (ICT) can be roughly defined as a diverse set of technological tools and resources used to communicate, create, disseminate, store, and manage information.
- However, ICTs are more than just these technologies as older technologies such as the printed textbooks and telephone.
While discussing the meaning of ICT, we also find that different technologies are typically used in combination rather than as the sole delivery mechanism to enhance the effectiveness of their use.

The importance of ICTs and its growing use in educational fields, the contemporary learners are no longer isolated but are actually connected with each other and also with their teachers in an electronically supported community.

The use of ICTs in both school and higher education has developed greater self-direction and motivation in the learners. This has helped them move away from teacher-centric approach to self-learning approach.

Communication is fundamental to the human civilization for a society can function only when communication is made possible among the members of the society.

With the emergence of the digital age, communication technologies re-emerged with a new name—Information and Communication Technologies or ICTs to transform the human society like never before.

The growth of modern communication technology begins with the emergence of the print media. The important point is that even in the contemporary age of computers and satellite communication system, print materials have not lost their importance as a tool of communication.

The radio is a comparatively recent invention. However, its growth took place mainly around 1920s and 1940s. Since then, radio has transformed Indian society like never before.

Along with the radio, there emerged television in the late 19th century and early 20th century. Subsequently, audio-visual technologies rapidly expanded all over the world.

Telecommunication technologies began with the transmission of telegraphic signals over wires. The latest invention of 2G and 3G technologies have changed the entire experience of mobile telephony and the Internet connectivity.

Multimedia communication is a type of media and content utilizing a combination of different forms of communication.

The most noticeable revolution initiated by the ICTs is the creation of the World Wide Web (WWW) and its potentials discovered in the early 1990s.

Teleconferencing refers to ‘interactive electronic communication among people located at two or more different places’.

The application of ICTs in education can be briefly understood in terms of the following two points: (i) access and (ii) teaching-learning.
• In a conventional face-to-face education system, education was considered to be a one-man show played by the teacher. Moreover, it was a general belief that learning takes place only within the four walls of a classroom set-up.

• Communication technologies have replaced both the teacher and the textbooks, and have made teaching-learning an enjoyable activity by placing the learners at their own in the learning process.

• Information and Communication Technologies (ICTs) have offered the developing countries multifarious opportunities to enhance educational systems, improve policy formulation and execution, and widen the range of opportunities for all, especially the unreached.

• In today’s context, there is no doubt about the fact that ICTs are potentially powerful tools for extending educational opportunities to the marginalized groups.

• The basic objective of CML (Computer Managed Learning) is to relieve the teacher from these tedious time-consuming tasks so that he can more profitably utilize his time and energy for instructional work.

• Computers can never be a threat to teachers. The computer is after all a tool itself, incapable (so far) of independent action. It has no inborn wisdom. It carries out the instructions given to it at incredible speed.

13.6 KEY WORDS

• Information and communication technology (ICT): It refers to a diverse set of technological tools and resources used to communicate, create, disseminate, store, and manage information.

• Multimedia communication: It refers to a type of media and content utilizing a combination of different forms of communication.

• Symbolic characteristics: It refers to the types of symbols that a medium uses to represent and communicate the information.

• Teleconferencing: It refers to interactive electronic communication among people located at two or more different places.

13.7 SELF ASSESSMENT QUESTIONS AND EXERCISES

Short Answer Questions

1. Write a short note on the meaning of information and communication technology.
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2. Why is communication fundamental to human civilization?
3. What are the four main types of teleconferencing techniques?
4. How has ICT gained popularity among the masses in the existing times?
5. What are the main advantages of ICT in distance education?
6. List the uses of computer in education.

Long Answer Questions

1. Explain the role and significance of information and communication technology in distance education.
2. What are the various stages involved in the development of ICT? Discuss in detail.
3. Analyse the applications of ICT in education.
4. Discuss the challenges faced by ICT in educational use.
5. What are the educational implications of computers? Explain.
6. Interpret the uses of computer in education in detail.

13.8 FURTHER READINGS


UNIT 14 E-LEARNING

Structure
14.0 Introduction
14.1 Objectives
14.2 E-Content
  14.2.1 Nature and Characteristics of E-Learning
  14.2.2 Advantages of E-Learning
14.3 E-Book: Merits and Demerits
14.4 E-Journal: Merits and Demerits
14.5 Multimedia
  14.5.1 Need of Multimedia
  14.5.2 Benefits and Limitations of Multimedia
14.6 Applications of Multimedia
14.7 Interactive Multimedia
  14.7.1 Advantages of Learning through Interactive Multimedia
14.8 Answers to Check Your Progress Questions
14.9 Summary
14.10 Key Words
14.11 Self Assessment Questions and Exercises
14.12 Further Readings

14.0 INTRODUCTION

Computers with their unimaginable working and functioning capacity coupled with a tremendous progress in the field of electronics and communication technology have yielded much power, abilities and capacities to human beings. This enables them to boast to do anything and everything imaginable or unimaginable on this earth.

Teaching and learning that entirely happened to be a domain of the human factors—teacher and students—is now no longer limited to its traditional boundaries or ways and means. It has gradually turned into a subject of technological progress. Computer operation and networking have almost revolutionized the field of teaching and learning. Instead of the total dependency on the instructions imparted by the teachers and the subject matter available in the books, or other printed publications, the learners are now able to utilize the computer’s database and networking facilities not only for seeking information but also for interacting with them online in the manner as happens in the real classroom encounters. Therefore, there is no exaggeration in saying that the future of education and classroom instructions lies to a great extent in the concept and practices of e-learning and virtual classrooms.

E-learning can be defined as an electronically carried out learning facilitated and supported by the use of advanced learning technology particularly calling for the services of computers, networking and multimedia.
In this unit, the meaning and characteristics of e-learning has been analysed. The advantages and disadvantages of e-books and e-journals have been discussed. The unit will also provide an in-depth knowledge about the uses of multimedia and interactive media.

### 14.1 OBJECTIVES

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

- Discuss the meaning of e-learning and list its characteristics
- Interpret the merits and demerits of e-books
- Analyse the advantages and disadvantages of e-journals
- Explain the meaning of multimedia and its importance
- Identify the uses of multimedia in various sectors
- Discuss the meaning and advantages of interactive multimedia

### 14.2 E-CONTENT

E-learning, or ‘electronic learning’, in general, may refer to all types of learning facilitated and supported through the use of information and communication technology; in real practical sense, its use is limited and associated nowadays with the field of advanced learning in learning using networking and/or multimedia technologies. In this sense, e-learning may call for the services of the advanced electronic information and communication media and means such as CD-ROMs and DVDs, teleconferencing, video-conferencing and computer based conferencing, e-mail, live chat, surfing on the Internet and Web browsing, online reference libraries, video-game style simulation, customized e-learning courses, and Web blogs.

The term ‘e-learning’ has entered the realm of teaching and learning in the similar way as other related terms such as e-mail, e-banking, e-booking and e-commerce tend to exist with us in our day-to-day lives. What seems to be common in the nature, functioning and use of these terms may be summarized as follows:

- They all call for the services of the computers, laptops and their technologies in their functioning.
- The use of the Internet services and Web technology is must for their functioning.

Having a proper look at the nature and use of e-learning dominated by the Internet technologies, Rosenberg (2001) tried to define the term e-learning as: ‘E-learning refers to the use of the Internet technologies to deliver a broad array of solutions that enhance knowledge and performance.’
14.2.1 Nature and Characteristics of E-Learning

The characteristics of e-learning are as follows:

- E-learning is a generic term used to refer to computer-enhanced learning.
- Its use should be strictly limited to 'online learning' carried out through the Internet or Web-enabled technology.
- It conveys broader meaning than the terms 'computer-based learning' and 'computer-aided instruction'.
- It is broader in its meaning than that conveyed through the simple terms like 'online learning' or 'online education' (that may call for the absolute Web-based learning without any follow-up, communication and interaction between the teacher and students).
- It should not be taken as being synonymous to audio–visual learning, multimedia learning, distance education or distance learning. It is true that the audio–visual and multimedia technology and distance education programmes rest heavily nowadays on the use of the Internet and Web services provided through the computers, yet these are not identical but complementary.
- It should be made absolutely clear that the use of the term ‘e-learning’ should be restricted to the type of learning carried out, facilitated or supported through Web-enhanced instructions and the Internet-based communication like e-mail, audio and video conferencing, mail list, live chats, and telephony. As a result, all types of non-Internet and non-Web technology should not be included in the domain of e-learning.

Taking a clear stand on this issue, Santheesh Kumar and Sagy John (2008) wrote: ‘Though computer is used for instruction and learning, the non-Web technology does not come under e-learning. The entire computer-based instruction like computer-assisted instruction, computer-managed instruction, integrated learning systems, multimedia, interactive video, virtual reality and artificial intelligence which are not delivered through the Internet but are still used for learning and instruction cannot be included in e-learning. However, these techniques, when delivered via Internet for instruction and learning, become e-learning.’

14.2.2 Advantages of E-Learning

E-learning as an innovative technique provides unique opportunities to the learners for gaining useful learning experiences both on the individual level and the group level. Its advantages are as follows:

- Most of the learners who may not have the time and resources for getting access to the traditional class-bound learning experiences may get it now easily at their convenience in the form of e-learning. A learner can now satisfy his desire and fulfill his ambition of getting access to school or higher
education or take up a hobby course without learning his job, compromising
his comfort or feeling handicapped in one or the other sense on account of
his limitations. The learners can access information and educational contents
any time, any place.

- E-learning has enough potential to make the education, instruction and
learning opportunities provided to the learners adaptable to their needs-
mental and skill level-local needs and resources at their hands.
- It has a unique feature of arranging an access to the same quality of the
content that a full-time student has. The best of the world’s educational
content, treasury of knowledge and the opportunities are available through
e-learning to an increasing number of learners, especially in the developing
and underdeveloped countries.
- Unlike traditional classroom education, e-learning can cater to different
learning styles and promote collaboration among students from different
localities, cultures, regions, states and countries.
- E-learning can prove an effective media and tool for facing the problems of
lack of the trained and competent teachers, paucity of schools and the
needed infrastructure and material facilities for providing quality education
to the number of students residing in the far and wide corners of the country.
- The flexibility of e-learning in terms of delivery media (CD, DVD, laptops,
and mobile phones), type of courses (modules or smaller learning objects)
and access (real time or self-paced) may prove a big advantage and attractive
option.
- E-learning may make the students more interested and motivated towards
learning as they may get a wide variety of learning experiences by having
access to multimedia, the Internet, Web technology and mobile-learning
along with the verbal and non-verbal presentation of the learning contents.
- The opportunities of having an online, offline and live interaction between
the students and teachers and among the students themselves may make
the task of e-learning a joy and best alternative to the lively face-to-face
interaction and real time sharing of the experiences in a traditional classroom
setting.
- E-learning through audio-visual recording technology has a unique advantage
of providing learning experiences that can be paused and reversed for
observing, learning and imitating at the will and convenience of the learners.
Such self-pacing gives a special weightage to the process of learning.
- It may also provide opportunities for testing and evaluating the learning
outcomes of the learners through teachers, peers and auto-instructional
devices and software available with the reading material online, or through
the Internet and mobile phone facilities. It may work for them as a desired
source for the proper feedback along with the needed diagnostic and
remedial teaching.
Learning experiences via simulated and gaming techniques, may also provide the benefits of getting richer experiences on the useful pedagogical footings of play-way spirit and learning by doing or living.

Check Your Progress

1. What are the main characteristics of e-learning?
2. State one advantage of e-learning.

14.3 E-BOOK: MERITS AND DEMERITS

An electronic book is also commonly known as an e-book or eBook. It is a book publication which is made and available in digital form and comprises of text, images, or both, readable on the flat-panel display of computers or other electronic devices. There is a growing interest in converting paper books to bytes (Carvaial 1999) as well as writing new titles in digital form. This in turn has resulted in a collection of hybrid definitions of e-books. Initially, paper books that had been converted to a digital format, usually through digitizing processes which allow them to be displayed on computers, were defined as e-books. Then, the term also began to encompass multimedia, hypertext or hypermedia systems that are based on a book metaphor. Recently, the definition of an e-book has been extended to include book titles that are available online, that can be read as email, can be retrieved by a portable electronic reading device, or as a file that can be downloaded on to a computer. Another recent interpretation of an e-book is the ‘print-on-demand’ book where the contents are stored in a system connected to a high-speed, high-quality printer, from which printed and bound copies are produced on demand with the possibility of buying chapter-by-chapter and customised books.

There are a lot of definitions of e-book given by scholars and theorists. Some of them are as follows:

- Any kind of digitised information ranging from a CD-ROMs title to an online interactive database or a collection of web pages.
- A collection of reactive pages of electronic information that exhibit many of the characteristic features and properties of a conventional book.
- Learning environments which have an application containing a multimedia database of instructional resources that store pre-captured multimedia presentations about topics in a book.

The Open e-book (OEB) Forum avoids using the term ‘e-book’ because different people use the term differently. OEB defines a more precise terminology:

- The digital content which users read (i.e. a paperless version of a book, article and magazine) is called publication.
• The physical device used to read a publication is called a *reading device* (for example, dedicated readers personal computers or personal digital assistants).

• The combination of software and hardware that processes content and presents it to users is called a *reading system*.

**Merits of E-Books**

The following are the merits of e-books:

• E-books are delivered almost instantaneously. You can purchase, download and start reading them within minutes, without leaving your chair. It is not required for an individual to go to a bookstore to buy them, neither wait for them for days, weeks and sometimes more to arrive in the mail.

• No trees are required to manufacture paper for the pages of e-books.

• When you need certain information, you can get it immediately, by downloading an e-book.

• A lot of e-books are sold nowadays with bonuses, which you usually do not get with a printed book. This adds value to your purchase.

• E-books take up less space. You practically do not need any space to store them or a library or a room for them. You can store hundreds and thousands of e-books on your computer or reading device.

• E-books are portable. You can carry a whole library of hundreds of books with you, on CD, in a laptop, notebook or any e-book reader, without worrying about their weight.

• With today’s technology you can read e-books everywhere, on the bus, train, airplane, and while standing in line.

• You can carry with you a great number of e-books wherever you go, which you cannot do with ordinary books.

• E-books can show links, for easy access to more information and related websites.

• E-books are searchable. You can easily search for any information in an e-book, instead of turning page after page.

• E-books can be interactive and contain audio, video and animations, which can enhance the message that the author is trying to convey.

• Since, e-books are delivered through the Internet, there are no packing and shipping expenses.

• E-books can be printable, so that if you wish to read an e-book in the traditional way, you can very inexpensively print it with your home printer or at any printing shop.
• Fonts in e-books can be resized, making it easier to read for people with disabilities. With an additional software it is possible to turn some of the e-books into audio books.

• E-books are very easy to sell and distribute.

• It is very simple and easy to purchase and download an e-book. People living in big modernized cities, in a remote village in a faraway country or on a small island, can equally access an e-book. It takes them the same amount of time to purchase and download an e-book, provided they have an Internet connection.

• It is possible to purchase an e-book 24 hours a day, every day of the year, from the comfort of your own house or office. You can purchase and download an e-book, even if you are on a vacation. All you need is a laptop, tablet, smartphone, or a reading device, and wireless Internet connection.

• Nowadays, one can find e-books about every possible subject, fiction and nonfiction, free and not free.

• Considering non-fiction e-books, such e-books disseminate knowledge not pages, which means that it is not correct to evaluate the price of an e-book according to the number of its pages. The price should be determined by the information offered, its usefulness and its relevance, and also by the amount of practical knowledge, inspiration, motivation, tips and advice, and by the uniqueness of the information.

Demerits of E-Books

The following are the demerits of e-books:

• Programs need to be compatible with the computer or device. There are other software programs that can load directly onto a computer or handheld PDA. However, with the many operating systems that are out there and computer devices, not all programs are compatible with every computer.

• Programs need patching for security vulnerabilities. Three major free software programs for e-books are Acrobat E-Book Reader, Microsoft Reader, and Palm Reader. Any program that is on a computer and can be connected to the internet can be risky to the computer or device by creating vulnerabilities for attackers to exploit. For example, the website bugtraq.com follows new vulnerabilities and bugs reported a vulnerability found in the Acrobat E-Book Reader. Like any program, especially Adobe and Microsoft products, require security patches and updates to protect against these vulnerabilities.

• Anti-Virus, Anti-Malware and Spyware may change registry information. Often times, programs similar to SpyBot will alert the user to vulnerabilities and changes to the registry. The registry is the components that allow a program to work. Anytime a software program is updated, the
An alert will pop up via the anti-spyware service, asking if the user will allow the registry change. When a virus is on a program, the registry will try to change, denying it will stop the virus. Often times after an update, allowing the change to the registry will allow the program to continue running, and denying the change will make the program malfunction. The user may not understand the change, mistake the update for a virus, and deny a crucial registry change that allows the e-book reader to work.

- Not all book formats are compatible with the reader. Every e-book reader will allow different formats of text files to be read. Examples of format types are PDF, Word, PDB, HTML and BBeB. Depending on the file type of the book, the reader a user has may not allow it.

- E-book readers are special devices or programs on a computer that allow the user to access the book electronically. There is absolutely no paper involved. If there is a power outage and the batteries die the user will not be able to access the book.

- E-books can cause eyestrain. E-books are read on a computer or special device that is viewed on a screen. The screen does not have the same type of resolution like print on paper has.

- E-books do not have a defined life. New technologies are always emerging; for example, new computers or handheld devices. Software and hardware can become outdated that contain components that can run a user’s e-book reader. When upgrading to newer software, the user runs the risk of losing saved books or losing formatting of the document.

- E-books can be hacked. E-book readers are able to connect to the internet to shop for different e-books. Hackers are able to use their computers to hack e-book readers and e-books. People are now pirating e-books just as they are able to pirate music.

Check Your Progress

3. What do you understand by the term, 'electronic book'?

4. How is a reading device different from a reading system?

14.4 E-JOURNAL: MERITS AND DEMERITS

Electronic journal (e-journals) is a periodic publication in electronic format made available on the internet or in a CD-ROM. Introduced initially as complementary to paper-based journals (p-journals), e-journals have expanded, exponentially, during the recent past. Some journals are published only in the electronic format while some are published in print form in addition to the electronic form. Despite
numerous advantages associated with e-journals, there is a growing concern among academics regarding the quality of the content in some e-journals.

**Advantages of E-Journals**

E-journals are popular among people due to several reasons. Some of them are listed as follows:

- E-journals allow remote and easy access and provide access to multiple users simultaneously.
- In addition, e-journals can accommodate multimedia information, sounds, original data of the study and supporting documents.
- They require no physical storage space and can be saved digitally and hence environment friendly.
- They can be shared with others easily and some e-journals are interactive.

**Disadvantages of E-Journals**

E-journals have certain disadvantages. Some of their disadvantages are as follows:

- Not all e-journals are of high quality and the review process of some e-journals is questionable.
- They are not accessible without an internet. Hence if there is no internet connection one cannot read them.
- Libraries find it difficult to retrieve them rapidly when required. This may take more time and more working hours. In a complex situation, it is difficult to make predictions.

It is certain that the numbers of e-journals are expanding at a very fast rate. In order to retain the credibility of such journals, it is essential for them to adhere to the accepted principles of review process. Despite these limitations, e-journals will survive as they target readers specially the research scholars and directly deliver to them bypassing libraries.

### Check Your Progress

5. Define the term ‘e-journal’.
6. What are the disadvantages of e-journals?

### 14.5 MULTIMEDIA

Multimedia refers to a mixture of interactive media or data types, predominantly text, graphics, audio and video that are simultaneously delivered by a computer. Actually, a multimedia system implies a combination of specified hardware components with certain minimum capabilities and compatible software that has an interactive interface studded with different media elements. The difference
between a multimedia system and a television (where you also get simultaneous presentation of multiple media) is that in television, the delivery is not interactive and the user cannot control the way things happen, whereas a PC-Multimedia system allows the user to control the elements that are delivered with a varied degree of navigational freedom through linked elements.

Though basically multimedia presentation is dependent on the processing power and data-storage capacity of the computer, some basic hardware (H/W) components that make a complete multimedia system are as follows:

- Devices such as keyboard, mouse, joystick, touch screen by which the user can interact with the system.
- A high-resolution screen and graphics accelerator card that can provide good quality still images, video clips; animations; text and graphics.
- Speakers for speech and music output.
- Microphone for audio recording.
- Sound card and video grabber card to capture, digitize and edit audio and video material.
- CD-ROM drive to play back pre-recorded source (/) material. CD-ROM drive is a device that can read information from a CD-ROM.

With the rapid progress of the H/W industry, new generation processors and memory chips, various add-ons, computing accessories and devices upgraded kits are being continuously evolved. The PCs are becoming more and more powerful endowed with stunning multimedia capabilities. However, there is an international standard specification of a Multimedia PC (MPC) by an industry consortium called Multimedia PC Working Group (MPCWG), formerly known as Multimedia PC Marketing Council. The MPC specifications, which are upgraded from time to time, clearly define what should be the minimum features that a multimedia PC should have.

According to the latest MPC level-3 specification (the previous two being level-1 and level-2) a multimedia PC should have the following as the absolute minimum (even though a higher specification is recommended):

- 75 MHz Intel Pentium Processor or equivalent.
- 8 MB RAM.
- 540 MB Hard Disk Drive with 15 ms access time, 1.5 MB/sec sustained throughout.
- CD-ROM Drive with 250 ms access time, 600 KB/sec transfer rate.
- 3.5", 1.44 MB Floppy Disk Drive.
- Colour Monitor with display resolution of 640 × 480 with 65,536 (16-bit) colours.
• Video Playback (Full Motion Video): MPEG1 decoding support with its output being able to drive at least a 320 × 240-pixel video window, at 30 fps and with 15 bits/pixel.
• 101 key IBM compatible keyboard or equivalent.
• Two button Mouse.
• Audio board.
• MIDI input-output port.
• Joystick port.
• Headphones and/or speakers.
• Serial and Parallel ports.
• Software: DOS 6.0 or later, Windows 3.11 or later.

The MPC level-3 specification was released in 1995. However, with respect to the current market standard MPC level-3 may seem to be quite outdated. After Windows 3.11, Windows 95, 98, 2000, and XP have come up with improved GUI and support a variety of multimedia devices. Moreover, 3GHz Pentium -4 PC’s with 80 GB HDD are now commonly used. In addition, most of the multimedia applications today require at least 256 MB RAM, if not more.

The multimedia devices and drivers are managed by the [mci] and [drivers] section of the Windows SYSTEM.INI file, that can be added and deleted using the Multimedia Properties control panel. The device properties can also be adjusted from there.

By reading the SYSTEM.INI text file when it starts up, Windows knows what multimedia devices are present in the system and initializes them.

14.5.1 Need of Multimedia

The application areas for digital multimedia are continuously increasing since the last decade. It has become an indispensable tool for visualization and storage of the happenings around us. In fact, digital multimedia can be effectively used wherever there is scope for representing some information interactively using text, sound, image and video. The several key areas where multimedia technology has been effectively utilized for the benefits of the people are:

• Education and training: Digital multimedia libraries of interactive e-learning courses are available for individual as well as corporate-level training. It is a great boon of multimedia technology and is spreading rapidly all over the world as a very popular and dependable means of distance education. A quality e-learning module facilitates self-paced training with quality courseware prepared by competent and experienced faculty members that provides great relief and help to students who are otherwise deprived of classroom teaching. Even when classroom training is available, e-learning
may effectively supplement such formal training with features, such as interactivity, multimedia demonstration and quizzes. Further, e-learning is usually implemented through a web-based Learning Management System (LMS) that keeps track of the student’s progress and performance.

- **Entertainment industry**: Any activity that gives pleasure to the audience is entertainment. It can be a show or performance by an individual or a group, such as a magic show, a theatre, a football match or a movie show. The industry that provides entertainment is called the entertainment industry. With the advent of digital multimedia, the entertainment industry has been using digital multimedia tools and techniques for creating special effects, developing interactive computer games, edit movies, create animation films as well as restore and enhance classic films of yesteryears. The audience may participate actively in a computer game or passively as in watching an animation film or a movie with special effects created using digital multimedia tools, but the role of multimedia is always there.

- **Household services**: Today, you can routinely use multimedia technology in various forms in your home, such as for self-paced education, home shopping (railway or airlines booking, product demonstration, e-filling of forms), communicating with distant relatives through multimedia chatting. Other application areas are video on demand, interactive TV, etc., that are gradually becoming popular.

- **Business services**: Multimedia technology is routinely applied in videoconferencing in a cost-effective way, e-mail and multimedia chatting for routine official correspondence and transaction of important multimedia documents across the globe.

- **Science and technology**: Visualization and simulation can be done using multimedia technology for all branches of science and technology.

- **Medicine**: Interactive multimedia technology can be used in implementing telemedicine projects to cure patients at far-off places. Multimedia databases provide support for queries related to medical science and patient related queries including case history, X-rays, scanned images, assessments and response.

### 14.5.2 Benefits and Limitations of Multimedia

The following are some of the benefits and limitations of multimedia:

**Benefits**

- The portability of digital multimedia formats facilitates easy transportation and helps in manipulating information comprehensively.
- Careful use of media files can make a web page, blog post or a report more engaging than simple plain text, emphasizes key pieces of information.
E-Learning

- It increases learning effectiveness in education and training programs.
- It is more appealing over traditional lecture-based learning methods.
- Offers significant potential in improving personal communications, education and training efforts.

Limitations

- Multimedia formats and the devices that play or store them require a constant supply of power and frequent updating that can be problematic in more remote areas.
- As technology rapidly evolves, compatibility between different devices can also be a problem when trying to move or play multimedia content.
- The factor of expense is unable to keep up with technology for financial reasons or geographic isolation.
- Adding multimedia increases the number of codec and plug-ins a browser needs to load the page which leads to slower loading times.
- Multimedia also leads to a third-party problem, such as if a video being removed from the referenced websites or links then it will leave a blank space in any post in which the video has been embedded.

Check Your Progress

7. How are multimedia devices managed?
8. What is the main use of quality e-learning module?

14.6 APPLICATIONS OF MULTIMEDIA

In the twenty-first century, IT provides many services such as airlines, hotel management and Web publishing and so on. Some of these services are explained in the following sections.

Airlines

The air travel industry is one of the biggest users of information technology. There is hardly any aspect of the airline business in which computer systems have not been deployed for increasing revenues, reducing costs and enhancing customer satisfaction.

It is now almost inconceivable to book a ticket or get a seat confirmed across multiple sales counters (airline offices and travel agents) spread over numerous cities, without using computerized databases and e-networking. Like most other industries, the use of computerized systems in the air travel industry
started with the front office and sales desk with back-office operations playing a crucial role in delivering a quality experience to consumers. What typically started as airlines intranet systems have now blossomed into vast Web-based online systems which can be accessed by anybody from anywhere in the world.

The following are some of the interesting areas where IT has been used successfully:

a) **Online ticket reservation through the Internet**: Today, most leading airlines like United Airlines, Delta and British Airways sell tickets through their Websites. You can book the ticket through the Internet, pay online by giving your international credit card details and then collect the ticket (on the day of journey), boarding pass from e-ticket kiosks at the airport by simply furnishing your booking reference details.

b) **Flight and seats availability**: If you wish to travel from New Delhi to New York and do not know what your flight options are, simply log onto the airline site, specify the cities of travel origin and destination along with preferred journey dates and the database would yield all the possible options. Once you have selected the flights, you could even go a step further (possible in case of a few airlines) and book a specific seat number in that flight along with the choice of meal.

c) **Last minute deals and auctions**: A seat is a perishable commodity. An unsold seat means a revenue opportunity lost forever. Therefore, most airlines have now started a facility on their website where potential customers can bid for last minute tickets in online auctions. This is a case of win-win by effective use of IT—the passenger is happy at getting the ticket at a fraction of the ticket’s normal cost and the airline is able to recover something from what might otherwise have been an unsold seat.

All these facilities/opportunities would have been impossible without an integrated online computer system.

**Telephone Exchanges**

The first telephone service invented by Alexander Graham Bell was strictly ‘point-to-point’, i.e. each user had to be physically wired to every other user. There was no ‘telephone exchange’. Needless to say, Bell immediately realized the need for an exchange and made one. In this first exchange each subscriber had to be wired only up to his local exchange. An operator sitting in the exchange, connected him to other subscribers upon request (earlier phones did not have dialling facility) by physically connecting the caller’s wire to the recipient subscriber’s telephone by using a hand-actuated circuit switch. One does not need to stretch one’s imagination to appreciate the fact that operator-controlled exchanges were not only extremely labour-intensive but also highly error-prone.
Now, compare this to the digital, computerized telephone exchanges used today. These are the electronic systems that do the switching operation based upon a ‘stored program control.’ The rules defined in the software assess which destination the caller is trying to reach, plot the most optimal path, intimate the called party, inform the caller about his call status and then if the called party accepts the call, establish the circuit. The call is monitored during its progress and the circuit is disconnected once the call is terminated. Computerized exchanges improve and enhance call-processing capacity, thereby lowering the cost of operations. They also opened up a wide array of IT-enabled services for subscribers that have made modern telephony an indispensable service.

Bharat Sanchar Nigam Limited (BSNL), one of the main providers of telephone services extensively use a product called Infotel for managing their telephone exchanges. This product provides:

a) **Provision of facilities**: Activation, deactivation and modification of subscriber facilities, such as ISD, STD, call waiting, call transfer and computer-generated bills.

b) **Fault booking and restoration service**: Maintenance of a database of complaint calls either through an IVRS (interactive voice response system) or a customer service cell. The system automatically creates the complaint docket and generates a range of statistical and exception reports.

c) **Line data maintenance**: The system provides online data on cable codes, cable pair numbers, cabinet number and pillar numbers for all subscriber connections to facilitate and expedite line repair and maintenance.

d) **Directory enquiry**: The computerized subscriber database also allows extensive online or voice-based directory enquiry based upon subscriber name, location, telephone number and mobile phones.

Statistically, major portions of the population of any developing country still do not possess a telephone. Making a simple call to anybody requires locating the nearest telephone booth, waiting for one’s turn in the queue and then paying for a short chat on (most often) a disturbed line.

In the developing countries, the penetration of landline phones has been low largely due to the hassles of laying cables across long distances. Especially in the case of remote areas, the cost of connecting a few phones to the mainland mass becomes disproportionately high. Maintaining these telephone cables across inhospitable terrain also poses a major challenge to network expansion planners and engineers.

Due to the advances made in the telecommunications industry in the last two decades, mobile phones provide an excellent cost-effective and efficient alternative to the land phones for developing countries like India.
A cellular phone (as mobile phones are also known) is primarily a radio—a very sophisticated variant of a radio telephone. The genius of a cellular system is the division of the city into small cells (hexagons on a big hexagonal grid). Each cell has a base station that consists of a tower and a small building containing the radio equipment. Wireless communication is possible within and across the cells, allowing a user complete mobility and making communication much easier and less time-consuming. Through switching devices in landline telephone exchanges, mobile phone users can also access the global landline network, effectively bringing everyone within speaking distance.

The mobile phone industry owes its growth to information technology which is in fact central and pivotal in any mobile system. The following technologies are often associated with mobile phones.

a) **Personal communications service (PCS):** Personal Communications Service (PCS) is a wireless phone service somewhat similar to a cellular telephone service but emphasizing on personal service and extended mobility. It is sometimes referred to as digital cellular (although cellular systems can also be digital). Like cellular, PCS is for mobile users and requires a number of antennas to blanket an area of coverage. As a user moves around, the user’s phone signal is picked up by the nearest antenna and then forwarded to a base station that connects to the wired network.

b) **Time Division Multiple Access (TDMA):** Time Division Multiple Access (TDMA) is a technology used in digital cellular telephone communication that divides each cellular channel into three time slots in order to increase the amount of data that can be carried.

c) **CDMA:** It employs Analog-To-Digital conversion (ADC) in combination with spread spectrum technology. Audio input is first digitized into binary elements. The frequency of the transmitted signal is then made to vary according to a defined pattern (code), so that it can be intercepted only by a receiver whose frequency response is programmed with the same code, and so it follows the transmitter frequency exactly. There are trillions of possible frequency-sequencing codes. This enhances privacy and makes cloning difficult.

d) **Global System for Mobile (GSM):** Global System for Mobile (GSM) communication is a digital mobile telephone system that is widely used in Europe and other parts of the world. GSM uses a variation of (TDMA) and is the most widely used of the three digital wireless telephone technologies (TDMA, GSM and CDMA). GSM digitizes and compresses data, then sends it down a channel with two other streams of user data, each in its own time slot. GSM is in fact, the de facto wireless telephone standard in Europe.
Today, mobile phones are proliferating as handsets are getting cheaper and call rates are declining, bringing them within the reach of the common man. They provide an array of functions (some very simple and others very sophisticated). Some of the popular functions which are based upon IT are as follows:

- **a) SMS (Short Messaging Service):** Small text messages can be exchanged between people who do not believe in long verbal conversations over communication channels. In fact, today SMS has gained popularity as a medium for exchanging messages.

- **b) Address Book:** It is a store of contact information maintained on the mobile handset or the central server. It does away with the usual problem of maintaining a usual address book and allows the phone user to dial numbers without having to bother about carrying a bulky file-o-fax or telephone diary along.

- **c) Schedules or To-Do Lists:** You can store a list of important tasks that you wish to accomplish. Most mobile phone software also provides options for appointments and reminders associated with these tasks.

- **d) Send or Receive E-Mail:** Thanks to WAP technology, it is now possible to access your e-mails by using your mobile phone. Popular portals like Yahoo and Rediff offer a facility whereby the users get automatic alerts on their mobile phones as soon as any new mail arrives. You can also use your mobile phone for chatting by using your MSN or ICQ account.

- **e) Get Information Updates:** All mobile service providers now provide add-on facilities for their subscribers to receive regular updates on news, entertainment, stock market prices. This is done by integrating Web-based databases with the mobile users’ database. Service providers also use this ability to advertise for new products, services and schemes.

As you can appreciate, all the above facilities are based upon the usage of electronic databases and intelligent software available on the mobile phone. Due to the global trend of convergence the dividing line between information technology and telecommunications technology is getting increasingly blurred. Today’s computers combine phone, fax, television, VCD/DVD drives, stereo—all in one seamless bundle.

**Hotel Management**

The hotel industry is an integral part of the tourism industry, which is a vital source of revenue and foreign exchange for a country’s economy. A vibrant hotel industry means greater employment generation. However, since this industry relies on an easy and quick availability of information, the role of IT in its development and growth cannot be over-stressed. In fact, IT has revolutionized the hotel and tourism
industry. Due to IT, you can have all the information about the tourist spots, hotel infrastructure, room availability, tariff details, online booking, etc. at the click of a button. IT plays a critical role in improving the hotel’s performance because of its potential of creating customer relationships and the flow of information between the people and customers.

There are numerous instances of use of IT in hotel industry. Some of these are as follows:

a) Today’s hotel management software means that the moment a guest expresses any interest in staying at the hotel, till the time he checks out, all transactions with him (room charges, food and laundry bills, business centre, health centre, and hiring cars) are recorded electronically, making information available at the click of a button.

b) Many leading hotels offer online booking facility for tourists and guests. This makes it very easy for the tourist as he has beforehand knowledge of room availability and charges. There are several Websites totally devoted to this. A tourist, for example, can specify the city and his budget. Based on this information, the search facility throws up a complete list of hotels available. Moreover, the tourist can even specify his preferred location. Once the hotel is identified, booking can be made online by using an internationally valid credit card.

c) Nowadays, most of the hotels have computerized their records. As a result, it is very easy to know the details of room available at a particular time. The information about the occupant is also available instantly. This computerized system typically integrates all hotel MIS functions into one system. Inter-continental hotels and resorts use a global strategic marketing database. All these are examples of use of IT in hotel industry, which have made significantly transformed operations and profitability.

d) Hotel information systems help users to access guest database information and use the information to create attractive one-to-one reservation confirmations, e-mail marketing and sales messages, custom reports and e-mail comment cards to reinforce guest relationships.

e) Information technology is being increasingly used by International hotel chains to formulate and align their corporate strategies.

Web Publishing

Traditionally, ‘publishing’ has meant dealing with printers, paper, distribution, expensive infrastructure and static content. The drawbacks of traditional publishing are that they require a huge amount of investment, the productivity is low as a lot of manual and machinery work is involved, the content published cannot be changed easily and the scope of marketing the product is very limited. All these drawbacks have been overcome by the development of Web publishing.
Web publishing is an umbrella term for putting content on the World Wide Web and includes all support arrangements required for it. It includes custom Web designs for Web development, Website hosting and e-commerce. Originally, Web publishing simply meant putting selected content on paper into HTML over a Website for public access. This is also known as i-paper. This method of publishing is not widely used anymore as professional web publishers now use modern software, such as content management systems for rearranging the structure of a Website and making its content dynamically modifiable.

The most important tool of information technology used in the process of Web publishing is the World Wide Web. This makes content available twenty-four hours a day, seven days a week, to anybody in the world who is connected to the Internet. The only requirement for publishing and viewing the content online is a computer or a handheld device which has an Internet connection and a Web browser. The scope of Web publishing in terms of penetration is very high with an estimated 1.5 billion Internet users worldwide, as of 2007. The relative low cost of buying a domain name and hosting a Website is another major driver behind the large amount of online data available over Websites.

Financial Accounting

Financial accounting was one of the first business functions for which software applications were developed. The importance of financial accounting and management for any business cannot be overemphasized, but the scale of transactions, the repetitive and structured nature of the data and the sheer volumes involved in the case of large corporates makes an ideal case for computerization. Computerizing accounts also takes the drudgery out of bookkeeping, which means that accountants can now concentrate more on analysing information rather than on devoting countless hours merely in filling out vouchers and updating registers and ledgers.

Typically, this is how a computerized accounting system works—the accounting clerk makes the voucher directly on the computer by using a financial accounting software package. The voucher on the screen looks very similar to a regular paper voucher and is in fact much simpler to fill because things like current date and voucher number are generated automatically. The appropriate account names that have to be debited or credited need not be typed but simply selected by the click of a mouse from a list of all ledger accounts. Appropriate checks and validations are also built into the accounting software which reduces the chances of errors. Unless, for example, the total of all debit accounts equals to the total of all credit accounts, the software will not allow the voucher to be saved.

Once the basic data has been entered into the computer voucher, the accountant can print out as many copies as required. Unlike a manual accounting system where the voucher, once prepared, has to be entered into the daybook and then posted in the relevant ledger account, the computer software does this
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automatically. In fact, the moment the voucher is entered and saved it is not only automatically posted to all the relevant daybooks and ledger, but also up-to-date trial balance, profit and loss account and balance sheet can be generated instantly showing the downstream effects on each one of them. Since, there is no time lag between voucher preparation and posting, the accounting software always shows up-to-date statement and final account.

Depending upon the size of the organization and the complexity of its operation, different software packages are readily available in the market. At the bottom end are popular and inexpensive software such as Tally and EX which are quite sufficient for most small and medium scale-organizations. Tally provides an excellent user-friendly interface through which all the accounting transactions can be entered or modified easily, and the user can see the effects of each transaction in all financial statements.

At the top end of the market is ERP (Enterprise Resource Planning) software such as Oracle Financials, Baan and SAP, which caters to the financial accounting and management needs of huge multi-location, multi-currency, multi-operations organizations like Nestlé, Pepsi, Coca Cola and Procter & Gamble. Such a software is called ERP software, since it provides completely integrated solutions for all functions of a business-like financial accounting, inventory, payroll and production planning and control. Despite the fact that ERP solutions typically cost millions of rupees and are relatively much more complex to implement, they provide an excellent platform for ensuring that the company’s system and procedure are uniformly followed across multiple locations (or even countries). Such systems also make it very easy to consolidate huge amounts of information from different profit centres and locations. Thus, effective, near-real-time management information can be generated to assist apex level decision making.

Weather Forecasting

Predicting the condition or state of the atmosphere after a period of time and over a certain region(s) is known as weather forecasting. The professionals involved in the study and prediction of weather are called meteorologists. The state of the atmosphere is governed by various factors, such as temperature, humidity and wind speed.

A few decades ago, man depended on the close observation of natural phenomenon and changes in atmosphere such as cloud formation, sky colour, wind speed, temperature, animal and insect behaviour to make weather predictions. Human senses and knowledge used to be the main driving factor behind these early predictions, which were limited to short-term forecasting and had low accuracy levels.
With the development in information technology weather forecasting has become a science rather than an art. Weather forecasting requires processing and analysing of huge amount of data very quickly. This makes it an ideal field for the application of information technology. The volume of data to be processed and the complexity of calculations that must be made in order to forecast weather with a certain degree of accuracy can be gauged by the fact that this task can only be performed by super-computers which work at phenomenally high speeds and can crunch huge amount of data very quickly.

The software and hardware tools provided by IT help in making accurate weather forecasts over longer time intervals. Large amounts of data are collected by weather balloons, satellites, sensors and radar instruments and fed into computers with huge processing power and data storage for quantitative analysis and weather modelling. Accurate assessments of the condition of weather over a period of three to six days can be made by using hydrological forecasts and warnings of extreme events can be issued over a lead time of five to ten days.

There is still a huge scope of development in the field of weather forecasting and information technology is driving it by developing better software for computer modelling, building and designing weather monitoring sensors for data collection, analysis and growing channels of weather forecasting services and making systems with huge computing power and storage space available.

**Remote Sensing**

The retrieval of data and information regarding an object or phenomena without coming into physical contact with it is known as remote sensing. The devices used for recording such data are known as sensors and depending upon the method of retrieval there can be either recording or real-time sensors. The technique of remote sensing determines if it is active remote sensing or passive remote sensing.

In the active remote sensing, artificial radiation is bombarded over a particular region of interest and the reflected rays are detected by the sensors to collect data and relevant information. An example of active remote sensing is the radar technology.

Passive remote sensing only detects natural radiations of an object or the one reflected from its surrounding area. The remote sensors do not emit radiation for measuring values of the object. A remote camera setup to observe wildlife and natural phenomenon is a good example of passive remote sensing.

In earlier times, our forefathers used to find high ground or climb treetops to map the surrounding landscapes for information. Later, in the year 1858, balloonist G Tournachon took photographs of Paris from his hot air balloon. Then, with the help of IT remote sensors, computer systems and software were developed to precisely monitor and collect geographic or spatially referenced data. The preceding traditional drawbacks have been successfully overcome with the help of IT.
The various applications of IT in the field of remote sensing are as follows:

a) **Software**: Embedded software are used to process data from remote sensors and turn it into relevant information. They also control the functions of a remote sensor by judging the data returned from it. Image enhancement and grouping applications, help in clearing the interference from raw images (captured images from camera with minimally processed data and huge detail) and can be used to transform multiple images into one high resolution continuous image.

b) **Hardware**: IT helps in designing customized hardware components for the purpose of remote sensing. The capabilities of a sensor can be optimized if they are redesigned for each application.

c) **Telecommunication**: Advancements in the communication between the sensor and the base station have helped in increasing the remote distance. Global environmental mapping would not have been possible without worldwide telecommunication. Figure 14.1 shows how remote sensing operates with the help of a satellite.

**Planning**

Planning in organizations—public and private—concerns both the organizational process of creating and maintaining a plan and the psychological process of thinking about the activities required to create a desired future on some scale. As such, it is a fundamental property of intelligent behaviour. The thought process is essential to the creation and refinement of a plan, or integration of it with other plans, that is, it combines forecasting of developments with the preparation of scenarios of how to react to them.

The term ‘planning’ is also used to describe the formal procedure used in such an endeavour, like creation of documents, diagrams or meetings to discuss the important issues to be addressed, the objectives to be met and the strategy to be followed.
Planning is a crucial aspect of an individual, organization and economy. It is done to attain growth, development and competitive advantage in a firm. Information technology tools have been a growing contributor to planning over a number of years.

It is a commonly acknowledged fact that with the right knowledge at the right time a firm can become the market leader of its products and services and continue to make profits for further growth. Therefore, planning helps an organization in facing and beating the competition. Second, the daily operations of an organization are becoming increasingly dependent on telecommunication and distributed networking processes.

Information and Communications Technology (ICT) tools greatly assist the planning process since they allow large amount of historical data to be processed and analysed which form the major requirement for the future planning process. Also, by using sophisticated scenario analysis tools, decision support systems allow the managers to know the repercussions of making long-term or policy decisions such as entering a new market or introducing a new product or increasing the prices of goods and services being offered. These packages, by using a combination of complex algorithms, mathematical calculations, statistical analysis, etc. allow the managers to predict the outcome of such policy changes and therefore enable them to plan better.

So, whether it a case of a small grocery store deciding what to order (from its suppliers) for the coming week’s sales, or a large multinational working in many countries trying to do the inventory forecasting for its thousands of stores, IT tools can be used to automate the basic number crunching (data collation and compilation) and make better decisions regarding the future.

Applications in Medical Science

Medical science is a branch of science that treats injuries and prevents and cures diseases by prescribing medicines or boosting the immune system of patients. IT has completely transformed the way modern medical systems work—from storing information about a patient’s history to developing new ways of diagnosing patients and educating students in medicine. IT has become such an integral part of the modern medical system that nowadays it is inconceivable to think how this industry worked without the aid of ICT.

Developments in medicine due to IT have offered significant benefits to patients and healthcare systems. Research in hi-tech medicine, such as genetic research, DNA modification, hospital infrastructure and rapid ambulance services have been facilitated by IT. Medical scientists can now use computers to check the effectiveness of a drug against a disease by modelling their genetic structure on computer-based software and using high-speed processors to simulate the process.
The storage and rapid access to electronic medical records and its instant transmission over the Internet in large amounts is called teleconsulting where practitioners share patients’ data across the world to diagnose patients cooperatively without experiencing their medical history. Videoconferencing between surgeons allows the sharing of expertise so that complicated procedures can be carried out by sharing knowledge in real time. This allows doctors to develop expertise without the need for supervising surgeons to travel. Operations can be performed in areas in which they would not ordinarily be accessible, potentially saving or improving many lives, with the help of IT.

Medical images are sometimes so complicated that they cannot be effectively analysed without using computers. They can not only improve the image quality, but also adapt images to fit in accordance to the doctor’s wish.

**Entertainment**

No matter what your business is, IT can transform how you do business and bring many possibilities to life. IT has brought many changes in the entertainment field such as video games and special effect movies.

1. **Video games**: Games have been one of the most popular uses of computers. In fact, organizations such as Attari, Nintendo and Sony who were developers of video games have been instrumental in the improvements in the multimedia capabilities of desktop computers. Till about a decade ago, when personal computers had severe limitations of disc storage, processing speed and memory size, only very simple uni-dimensional video games were possible. But with the development of much faster Pentium series of CPUs with in-built multimedia capabilities coupled with improvement in digital storage and acoustics, today’s games are limited only by their creators’ imagination and not by any technological hindrances. Today’s games like Doom, Pokemon, PlayStation, Galaxian and Defender use very sophisticated graphics and sound techniques to create three-dimensional games.

   Some of the interesting developments in this area are as follows:
   - Virtual reality
   - Improvements in the specialized input devices like joysticks
   - Special game cards and enhanced graphic capability of CPU
   - Web games (Casinos)

2. **Special effects in movies**: Special effects in movies have come a long way since the early twentieth century. During the early years of moviemaking, special effects were limited to time-lapse cinematography where hand-controlled dummies were brought to life by stop motion filming which meant manually moving the animated model a fraction of an inch and taking a snapshot.
The early animation movies (popularly called cartoon films) involved a team of artists and painters who would painstakingly draw and paint each sketch frame by frame. The photography team would then click shots of these sketches at the rate of twenty-four frames every second and then edit them into a story.

Some of the interesting techniques used for creating special effects are as follows:

a) Digital compositing: Typically done through a process called ‘Bluescreen’ where the actors perform the scene in a studio in front of a large blue screen. A separate team of computer designers and artists create a virtual background (by mixing multiple photographs and computer-generated images). Later, the actors’ footage is superimposed on the top of the background to create a seamless ‘composite picture.’

b) Time slicing: In this technique a series of cameras are placed around the object of concern. All these cameras shoot pictures at precisely the same time. When these pictures are played together it appears as if there is one camera moving around the object. Coupled with other special tricks (such as slow-motion photography as used in the Matrix series) this creates an ethereal effect.

c) Computer-generated imaging (CGI): CGI techniques are used for creating scenes which are either not possible in real life or would be too expensive or dangerous to film.

None of the mentioned developments would have been possible without the fantastic developments in IT.

With the arrival of the CD-ROM and the Internet, the entertainment industry made a huge leap into a new era with a winning card—multimedia. Armed with animated images, sounds, full-motion video and interactive capability, multimedia became a dominant factor in today’s information age. The fast but steady growth of electronic technology allowed multimedia to gain popularity within a short span of time. Some applications of multimedia in the entertainment field are as follows:

- Games are the first thing that come to mind when we talk about multimedia. Multimedia capabilities are used to develop interactive games with sophisticated animations, 3D and sound effects. These games can be played on the computer, mobile devices or on the Internet. Live internet pay-for-play gaming with multiple players has attained significant popularity.

- Movies and cartoons unleashing full effects of multimedia, which were only available on VHS tapes, are now stored on CD-ROM (VCD) to allow the users to watch on their computer screen. Multi-layered digital
versatile disk with more storage capacity and even higher processing speed, is making its way into the market and slowly replacing the CD-ROM. It can be used to view movies and play audio files. Multimedia can be used in voice mail, chatting and video conferencing as well. You can also do real time video conferencing with your colleagues spread across the globe.

- Another common application of multimedia is the advent of animated e-greeting cards for different occasions.
- Wedding albums and family histories can be created on the World Wide Web using the power of multimedia.
- Multimedia has also found its application in hotels, pubs, shopping malls, museums, cinema halls, where stand-alone terminals or kiosks are made available for guiding users. Printers are also usually attached so that users can walkway with a printed copy of the desired information.

3. Multimedia in marketing: Advertising has become very prevalent in our daily surroundings, so for a product to stand apart, it is very essential to present it in a dynamic, visually stimulating manner to grab the attention of consumers. The business world is slowly rejecting run of the mill traditional methods (like placing ads in yellow pages, distributing pamphlets, etc.) and adopting solutions from the electronic era. Only companies with a nerve to radically change their marketing strategies for the new millennium will survive and be able to cater to the ever-changing customer’s mindset. Applications of multimedia in the marketing field include:

   a) Presentations: For launching the products of a company. Reaching the target audience with necessary technical services or products requires clear communication, stating the benefits and features, outlining its applications and any other product related details, all presented in a well-designed and interactive manner so that the users familiarise faster. Multimedia presentations are an excellent way to motivate, inform, and captivate a wide range of audiences via PC’s, laptops, plasma screens, or kiosks delivered via CD-ROM or the internet.

   b) Multimedia: To create interactive product catalogues, training tutorials, buyer guides, and information directories with adequate search and navigation facilities to guide the user to easily trace the desired information. A buyer guide can list the nearby dealers, a comparison of the top brands, maps of the city and other helpful guest services.

   c) E-mail advertising or placing banner ads on the Internet: An extremely cost-effective method of launching a product, promoting an event or selling services. Effective use of multimedia in advertising can make potential clients sit up and make notice.
d) **Interactive applications**: A great way to build brand loyalty and drive inquiries or sales. Sales may be increased by allowing users to view product options real-time. Brand loyalty can be built by giving users a custom application that entertains, informs or assists them.

e) **Motion, graphical elements, animation, audio and video**: Can be used to more effectively deliver sales, instructional or marketing messages to differentiate your firm from competitors.

**Manufacturing**

For any manufacturing firm, managing inventory is crucial. High inventory results in money being locked up unnecessarily, thereby reducing liquidity and indirectly profitability (if you offer immediate payment, most suppliers would be willing to offer you better rates). On the other hand, lower inventory of finished goods may lead to loss in sales or lower inventory of raw material may lead to disruption in production line. Optimum stock levels optimize operational efficiency.

Most large manufacturing units typically need hundreds (if not thousands) of raw material components and produce many products. Managing optimal inventory of such large number of items is a difficult task. It is here that information technology again plays a very useful role. Inventory management software provides facility for specifying (and determining) the maximum, minimum and reorder levels for each item, so that appropriate levels of inventory can be maintained keeping in mind lead times and Just-In-Time (JIT) systems (if any) for component suppliers.

Basically, this is how a typical computerized inventory system works:– a list of all the inventory items is prepared along with the maximum, minimum, reorder and current levels (quantity in hand as on a fixed date) for each item. This list is fed into the inventory software. Thereafter, all incomings (materials purchased or produced) and outgoings (sales or issues to production floor) are recorded through the inventory package. Since, the computer knows all the ins and outs for each item, it can track the exact quantity in hand for each. The package also generates reports for all the fresh stocks that need to be procured (based upon the levels specified). A variety of other useful MIS reports like aging analysis, goods movement analysis, slow and fast-moving stock report, valuation report, etc. can also be generated which assists the storekeeper and the accountants.

Some of the more sophisticated inventory packages (or inventory modules of ERP packages like Oracle financials, Baan, SAP etc.) automatically generate purchase orders (as soon as minimum level of any item is reached), provide automatic posting of accounting entries (as soon as any purchase or sale is carried out) and generate analytical reports which show the previous and future trends in inventory consumption.
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Some interesting innovations in usage of IT for better inventory management are as follows:

a) **Use of barcoding system:** Bar coding is a technique which allows the data to be encoded in the form of a series of parallel and adjacent bars and spaces which represents a string of characters. A bar code printer encodes any data into these spaces and bars and then it is used to decode the bar codes by scanning a light source across it and measuring the intensity of light reflected back by the white spaces. Bar coding provides an excellent and fast method for identifying items, their batch numbers and expiry dates without having to manually type or read the data (see Figure 14.2).

![Fig. 14.2 Bar Code](image)

b) **Use of hand-held terminals (HHTs):** HHTs are simple devices that are used to communicate with any type of microprocessor-based device. The standard input device is the keyboard (typically more akin to the calculator, rather than the computer keyboard) and a small LCD display for the output. HHTs are compact, simple and rugged devices designed for the outdoor applications like collecting information about inventory from large warehouses, recording movement of goods in and out, etc.

c) **Internet and intranets:** Many organizations (especially those following ‘just-in-time’ techniques) now have a system whereby the moment they receive an order or a request for an item (which is not in stock or whose stock is low), the inventory package automatically generates a purchase or supply order electronically and mails it to the preferred supplier—all this happens without any human intervention!

**Business**

Like banking, the insurance sector also deals contend with a lot of routine paperwork insurance policies, claims filed, survey or investigation reports and payment receipts. IT provides a perfect opportunity to reduce costs and processing times.

According to the Insurance Journal, ‘eighty-eight per cent of the insurers think that IT will become more important in driving efficiencies and cost-reductions in future. According to a new research released by RebusiS—an insurance technology solutions provider a further fifty-five per cent of respondents argued
that IT is currently playing an ‘important’ role in driving efficiencies and cost-reductions, with 43 per cent contesting that IT is ‘essential’ to business efficiency.

Typically, insurance companies use computerized databases to keep track of all the insurance policies, generating premium due statements, premium received receipts and lodging claims for insurance recovery. Basically, all kind of transactions are recorded and processed through computerized systems. This not only enables insurance companies to provide quicker and more efficient service to their clients, it also allows them to minimize their risks and maximize their profits by enabling complex financial, economic and demographic analyses of their customers. By using sophisticated computer programs, an insurance company can determine which customer segments are growing the fastest, which are most profitable, and which are riskier than others.

Although a lot of processes have been automated, things like insurance claims are still filed on paper forms first. The volumes involved are quite intimidating prompting some insurance companies in the US and Europe to outsource the entire data entry process to specialized offshore firms—many of such firms are in India.

This is how the typical process works—an insurance agent or the insured party fills up a paper form somewhere in the US. These forms are collected from multiple locations at one location such as the insurance company’s head office. A team of professionals from the data entry agency (working in the insurance company’s head office) scans these forms through high-speed scanners, generates image files for all the forms and then at the end of the day, using the Internet, transmits all these images to their data processing facility. Due to time difference, by the time this transmission is done at the end of the day in the US, it is morning in India. A team of trained data entry operators, using specialized software, views these forms (as images) on one portion of their screen and then types the same data in a database. Once the data has been properly verified and validated, the database is then uploaded on the network within a few hours. This means that the images that were sent from the US the previous night could be available in the US the next morning in the form of a computerized database. Of course, other than the effective use of IT, the time difference between the US and India has helped tremendously to make this ‘zero-time lag’ system a great success. This system of outsourcing one of the business functions is called ‘BPO’ (business process outsourcing).

Another more sophisticated alternative to this is OCR—Optical Character Recognition—where the images are run through OCR software that automatically converts these into text. OCR is only feasible where the text quality is very (typically typed or computer printed matter) high. Since, OCR operations still produce only 90–95 per cent accurate text, human intervention is still required to correct the mistakes made by OCR systems. In the course of time, however, technological
advancements can bring 100 per cent reliability and further change the face of remote-processing arrangements.

**Education**

Teaching has traditionally been associated with classroom instructions on a blackboard with the instructor (teacher) dependent almost entirely on his/her oratory and presentation skills for holding the attention of the class. From a student’s perspective, he had to keep pace with the instructor’s pace, which meant that the slower (though not necessarily less intelligent) student was at a natural disadvantage. Similarly, some students were more interested in a more in-depth study than the others. Since, access to information was neither easy nor inexpensive, these variables had always posed a major barrier to learning.

Ever since the advent of information technology, the scenario has changed dramatically. Today, the instructor has a repertoire of information technologies. To make the lecture not only more interesting but also more informative, there are advanced electronic teaching tools available. These vary from simple slide presentations to full-blown multimedia presentations which have video clippings, sound effects, animation and graphics to explain even the most abstruse subjects in a simple and easy-to-understand manner. As an example, a medical student does not have to pore over boring textbooks to understand human anatomy. Simple computer packages such as ‘Body Works’ are available which explain the same by using photographs, images and graphics that make in-depth learning fun rather than a bore. Moreover, learning is not only faster but is retained longer when test is supported by visuals and sound clips. Multimedia has transformed both classroom as well as online (distance) and packaged (CDs, VCDs and DVDs) education, in terms of both content as well as interactivity.

Some of the interesting developments in IT for the education sector can be seen in the following:

a) **Computer-based training (CBT)**: In most of the progressive institutes today, classroom sessions are complemented by CBTs. CBT typically comprise of user-friendly software in which the course syllabi is broken up into a series of interactive sessions. These sessions involve imparting a slice of knowledge to the student and then quizzing him to reinforce his understanding. Students have the option of going through these sessions at a time most convenient to them and at a pace best suited to them. CBTs also provide an excellent medium for the student to learn by exploration and discovery rather than by rote. However, education software is often positioned as ‘enriching’ the learning process and not as a potential substitute for traditional teacher-based methods.

b) **Internet**: Thanks to the Internet, any and every type of information is available at the click of a mouse. Students no longer need to trudge
long distances to visit a library and spend valuable time plodding through library catalogues to find the right information. By using a search engine, one can easily access the desired information. Also, knowledge is no longer restricted within the academic fraternity alone. Thanks to our networked world (intranet/internet) information dissemination is faster and widespread.

c) **Distance learning:** Information technology has also made distance learning a reality. You need not be physically present in a Business School to do a management course from there. By innovative use of information technology, educational institutes have reached out to students who would otherwise never have been able to enroll with them.

d) **Computerization of administrative tasks:** Most academic institutes use computerized systems for student enrollment, fee management, examination and administration. Enrollment forms, for instance, are now available on institutional websites, and examination results are usually available on the Internet. Some schools have also started collecting fees through the Internet by using credit cards.

### Check Your Progress

9. What is personal communications service (PCS)?
10. How is active remote sensing different from passive remote sensing?
11. What is bar coding?

### 14.7 INTERACTIVE MULTIMEDIA

Interactive multimedia is any package of materials that includes some combination of texts, graphics, still images, animation, video, and audio. These materials are packaged, integrated, and linked together in some way that offers users the ability to browse, navigate and analyse these materials through various searching and indexing features, as well as the capacity to explain or personalize these materials. Interactive multimedia is always ‘reader-centered’. In interactive multimedia, the reader controls the experience of reading the material by being able to select among multiple choices, choosing unique paths and sequences through the materials. One of the key features of interactive multimedia is the ability to navigate through material in whatever ways are most meaningful for individual users.

**What Kinds of Multimedia are Available?**

Educational multimedia packages and programs come in the same range and variety as printed textbooks, and all other teaching and reference materials. Some
multimedia programs are broad and comprehensive; some are more focused. Some programs address themselves to introductory students in a particular subject; some are suitable for more advanced students, or for teachers and scholars, or for the general public; and some work well at all ends of the spectrum depending how they are used. Similarly, some multimedia packages are more focused on primary texts and their contexts, while others are designed to bring the user into some kind of sophisticated contact with many different kinds of materials and processes.

Interactive multimedia can be used in the following areas:
- Games
- Education
- Training
- Information Presentation
- Simulation
- Corporate Presentation

14.7.1 Advantages of Learning through Interactive Multimedia

- Use of interactive multimedia in classroom helps in increasing retention rates and increases interest in the course subject.
- Helps in boosting curiosity, creativity, and teamwork amongst students.
- Interactive multimedia has helped in changing the role of teacher from the traditional role of omniscient ruler to that of a mentor and facilitator.
- Interactive learning multimedia package helps the students to learn themselves and provide them the direct communication. They can get direct feedback at the same time of their learning. Another thing is that as it is individualized learning students actively learns without the help of the teacher. Even one can have the related clues for learning which make learning interesting and active.
- It helps in motivating learners through special effects and the games added in presenting different topics which makes the learning more enjoyable. With simulation and animation, it gives unique experiences to the students and helps teachers to provide different topics in more interesting and realistic manner. It arouses motivation in the learner by presenting content systematically, interestingly and giving feedback efficiently. Even the games that are used to present content determine them to complete with themselves and to learn more.
- Provides wide range of experiences as the multimedia package helps the teacher to provide wide range of experiences. One can illustrate the concept through manipulation of graphics in different dimensions. Graphics, drawing
E-Learning becomes handy for the teachers. And the most encouraging thing about it is that whenever the teacher wishes one can modify that particular thing at one’s convenience. Those graphics also attract the student’s attention more and on the desired point. Concepts with the help of proper data, teacher can present diagrams and graphs which help them to understand the concepts clearly with longer effect.

Besides all these advantages, the main aim of using interactive media is that it gives the learner more confidence and freedom to design their own learning programme in terms of time, space and content. Variety and diversity according to the taste of the learner is possible through multimedia package which makes the students to get involved in the process of learning.

Check Your Progress
12. What are the areas in which interactive multimedia is used?
13. State the main aim of using interactive media.

14.8 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. The main characteristics of e-learning are as follows:
   a) E-learning is a generic term used to refer computer enhanced learning.
   b) Its use should be strictly limited to ‘online learning’ carried out through the Internet or Web-enabled technology.
   c) It conveys broader meaning than the terms ‘computer-based learning’ and ‘computer-aided instruction’.
2. E-learning can prove an effective media and tool for facing the problems of lack of the trained and competent teachers, paucity of schools and the needed infrastructure and material facilities for providing quality education to the number of students residing in the far and wide corners of the country.
3. An electronic book is a book publication which is made and available in digital form and comprises of text, images, or both, readable on the flat-panel display of computers or other electronic devices.
4. The physical device used to read a publication is called a reading device (for example, dedicated readers, personal computers or personal digital assistants). On the other hand, the combination of software and hardware that processes content and presents it to users is called a reading system.
5. Electronic journal (e-journals) is a periodic publication in electronic format made available on the internet or in a CD-ROM.

6. The following are the disadvantages of e-journals:
   a) Not all e-journals are of high quality and the review process of some e-journals is questionable.
   b) They are not accessible without an internet. Hence if there is no internet connection one cannot read them.
   c) Libraries find it difficult to retrieve them rapidly when required. This may take more time and more working hours. In a complex situation, it is difficult to make predictions.

7. The multimedia devices and drivers are managed by the [mci] and [drivers] section of the Windows SYSTEM.INI file, that can be added and deleted using the Multimedia Properties control panel. The device properties can also be adjusted from there.

8. A quality e-learning module facilitates self-paced training with quality courseware prepared by competent and experienced faculty members that provides great relief and help to students who are otherwise deprived of classroom teaching.

9. Personal communications service (PCS) is a wireless phone service somewhat similar to a cellular telephone service but emphasizing on personal service and extended mobility. It is sometimes referred to as digital cellular (although cellular systems can also be digital)

10. In the active remote sensing, artificial radiation is bombarded over a particular region of interest and the reflected rays are detected by the sensors to collect data and relevant information. On the other hand, in passive remote sensing only detects natural radiations of an object or the one reflected from its surrounding area.

11. Bar coding is a technique which allows the data to be encoded in the form of a series of parallel and adjacent bars and spaces which represents a string of characters.

12. The areas in which interactive multimedia can be used are as follows:
   a) Games
   b) Education
   c) Training
   d) Information presentation
   e) Simulation
   f) Corporate presentation
13. The main aim of using interactive media is that it gives the learner more confidence and freedom to design their own learning programme in terms of time, space and content.

14.9 SUMMARY

- E-learning, or ‘electronic learning’, in general, may refer to all types of learning facilitated and supported through the use of information and communication technology; in real practical sense, its use is limited and associated nowadays with the field of advanced learning in learning using networking and/or multimedia technologies.
- The term ‘e-learning’ has entered the realm of teaching and learning in the similar way as other related terms such as e-mail, e-banking, e-booking and e-commerce tend to exist with us in our day-to-day lives.
- E-learning as an innovative technique provides unique opportunities to the learners for gaining useful learning experiences both on the individual level and the group level.
- The flexibility of e-learning in terms of delivery media (CD, DVD, laptops, and mobile phones), type of courses (modules or smaller learning objects) and access (real time or self-paced) may prove a big advantage and attractive option.
- E-learning through audio-visual recording technology has a unique advantage of providing learning experiences that can be paused and reversed for observing, learning and imitating at the will and convenience of the learners.
- Learning experiences via simulated and gaming techniques, may also provide the benefits of getting richer experiences on the useful pedagogical footings of play-way spirit and learning by doing or living.
- An electronic book is also commonly known as an e-book or eBook. It is a book publication which is made and available in digital form and comprises of text, images, or both, readable on the flat-panel display of computers or other electronic devices.
- E-books can be interactive and contain audio, video and animations, which can enhance the message that the author is trying to convey.
- E-books can be hacked. E-book readers are able to connect to the internet to shop for different e-books. Hackers are able to use their computers to hack e-book readers and e-books. People are now pirating e-books just as they are able to pirate music.
Electronic journal (e-journals) is a periodic publication in electronic format made available on the internet or in a CD-ROM.

Introduced initially as complementary to paper-based journals (p-journals), e-journals have expanded, exponentially, during the recent past. Some journals are published only in the electronic format while some are published in print form in addition to the electronic form.

Multimedia refers to a mixture of interactive media or data types, predominantly text, graphics, audio and video that are simultaneously delivered by a computer.

A multimedia system implies a combination of specified hardware components with certain minimum capabilities and compatible software that has an interactive interface studded with different media elements.

The application areas for digital multimedia are continuously increasing since the last decade. It has become an indispensable tool for visualization and storage of the happenings around us.

Digital multimedia can be effectively used wherever there is scope for representing some information interactively using text, sound, image and video.

The air travel industry is one of the biggest users of information technology. There is hardly any aspect of the airline business in which computer systems have not been deployed for increasing revenues, reducing costs and enhancing customer satisfaction.

Bharat Sanchar Nigam Limited (BSNL), one of the main providers of telephone services extensively use a product called Infotel for managing their telephone exchanges.

A cellular phone (as mobile phones are also known) is primarily a radio— a very sophisticated variant of a radio telephone.

The hotel industry is an integral part of the tourism industry, which is a vital source of revenue and foreign exchange for a country’s economy.

Web publishing is an umbrella term for putting content on the World Wide Web and includes all support arrangements required for it.

The retrieval of data and information regarding an object or phenomena without coming into physical contact with it is known as remote sensing.

Planning is a crucial aspect of an individual, organization and economy. It is done to attain growth, development and competitive advantage in a firm. Information technology tools have been a growing contributor to planning over a number of years.

IT has completely transformed the way modern medical systems work—from storing information about a patient’s history to developing new ways of diagnosing patients and educating students in medicine.
Interactive multimedia is any package of materials that includes some combination of texts, graphics, still images, animation, video, and audio.

Interactive multimedia is always ‘reader-centered’. In interactive multimedia, the reader controls the experience of reading the material by being able to select among multiple choices, choosing unique paths and sequences through the materials.

14.10 KEY WORDS

- **E-learning**: It refers to all types of learning facilitated and supported through the use of information and communication technology.
- **Multimedia**: It refers to a mixture of interactive media or data types, predominantly text, graphics, audio and video that are simultaneously delivered by a computer.
- **Publication**: It refers to the digital content which users read i.e., a paperless version of a book, article and magazine.
- **Remote sensing**: It refers to the retrieval of data and information regarding an object or phenomena without coming into physical contact with it is known.

14.11 SELF ASSESSMENT QUESTIONS AND EXERCISES

**Short Answer Questions**

1. What are the main characteristics of e-learning?
2. List the advantages of e-journals.
3. What are the main components of a multimedia system?
4. Write a short note on the importance of multimedia.
5. What are the main advantages of interactive multimedia?

**Long Answer Questions**

1. Discuss the advantages of e-learning.
2. What are the merits and demerits of using an e-book? Explain in detail.
3. Describe the various uses of multimedia.
4. Analyse the meaning of interactive multimedia and its role.
5. How has multimedia contributed to the field of marketing? Discuss.
14.12 FURTHER READINGS


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