CHAPTER - 1

INTRODUCTION...
## CONTENTS

<table>
<thead>
<tr>
<th>CHAPTER I</th>
<th>INTRODUCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PAGE NO</td>
</tr>
<tr>
<td>INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>COMMUNICATION TECHNOLOGY IN EDUCATION</td>
<td>2</td>
</tr>
<tr>
<td>EDUCATIONAL TECHNOLOGY</td>
<td>2</td>
</tr>
<tr>
<td>Concept of Educational Technology</td>
<td>4</td>
</tr>
<tr>
<td>Objectives of Educational Technology</td>
<td>5</td>
</tr>
<tr>
<td>Definitions of Educational Technology</td>
<td>6</td>
</tr>
<tr>
<td>VIDEO ASSISTED INSTRUCTION</td>
<td>9</td>
</tr>
<tr>
<td>DEFINITIONS OF TERMS</td>
<td>11</td>
</tr>
<tr>
<td>Lecture Method (LM)</td>
<td>11</td>
</tr>
<tr>
<td>Conventional Non-Interactive Video (CNIV)</td>
<td>12</td>
</tr>
<tr>
<td>Instructor Controlled Interactive Video (ICIV)</td>
<td>12</td>
</tr>
<tr>
<td>EXTENTION EDUCATION IN AGRICULTURE</td>
<td>13</td>
</tr>
<tr>
<td>INTERACTION ANALYSIS</td>
<td>14</td>
</tr>
<tr>
<td>TAXONOMY OF EDUCATIONAL OBJECTIVES</td>
<td>15</td>
</tr>
<tr>
<td>NEED FOR THE STUDY</td>
<td>18</td>
</tr>
<tr>
<td>SCOPE OF THE STUDY</td>
<td>19</td>
</tr>
<tr>
<td>OBJECTIVES OF THE STUDY</td>
<td>20</td>
</tr>
<tr>
<td>Primary Objectives</td>
<td>20</td>
</tr>
<tr>
<td>Secondary Objectives</td>
<td>21</td>
</tr>
<tr>
<td>HYPOTHESES OF THE STUDY</td>
<td>21</td>
</tr>
<tr>
<td>TOOLS USED IN THE STUDY</td>
<td>22</td>
</tr>
<tr>
<td>METHODOLOGY OF THE STUDY</td>
<td>23</td>
</tr>
<tr>
<td>DELIMITATIONS OF THE STUDY</td>
<td>24</td>
</tr>
<tr>
<td>A BRIEF RESUME OF THE SUCCEEDING CHAPTERS</td>
<td>25</td>
</tr>
</tbody>
</table>
INTRODUCTION

Education is the process of bringing desirable change into the behaviour of human beings. It can also be defined as the process of imparting or acquiring knowledge and habits through instruction or study. When learning is progressing towards goals that have been established in accordance with a philosophy which has been defined for, and is understood by the learner, it is called 'Education'.

Education as a product is viewed as the sum total of what is received through learning, that is acquisition of knowledge, skills, attitudes and values, transmission of culture, development of personality and liberation of self actualisation. It has been now well established that education is one of the most crucial inputs for socio-economic development. Hence development of human resource is the main function of education. It is an important instrument for social and economic change and an investment for better future. It is a vehicle for accelerated, planned development seeking removal of inequalities. It is also an instrument for integrating people into a developing nation eradicating their harmful and obsolete attitude. It trains people for a wide variety of increasingly sophisticated and ever changing capabilities needed in industry, agriculture, administration and services providing the strength and resilience so as to respond to changing situations.

The UNESCO (1987) estimates that the countries in South-east Asia and China have about 90 per cent of the regions illiterates. Realising the danger of this disastrous situation, India has embarked upon a great adventure; the adventure of putting to use modern information and communication technologies for the delivery of education
services in as many manifestations as possible. New experiments, creative innovations and appropriate strategies are being developed and tried out to improve access to education and to re-orient the content and process of education at all levels.

COMMUNICATION TECHNOLOGY IN EDUCATION

Effective communication is the pre-requisite for rural development. Mass media promise to play an important role in transferring useful scientific information to people who live widely dispersed and remote villages of our country. In order to increase the knowledge of rural people, several communication media are being used.

Communication technology helps to bring about qualitative improvement in education by widening the access to it and reducing the existing educational disparities in the country. The communication revolution has brought in its wake a tremendous transformation both structural and functional in the society as a whole. This era of communication revolution was ushered with the advent of Skinner's 'Operant' and 'Educational Technology'. Educational Technology which implies the use of all modern media, methods and techniques in education needs to be utilized in an integrated manner for ensuring optimization in learning.

EDUCATIONAL TECHNOLOGY

New instructional practices and procedures are collectively referred to as educational technology. All technologies imply the application of known scientific principles for improving existing practices. Hence there are several ways of describing educational technology which are described in the forthcoming pages.

Educational Technology involves the systematic application of scientific and technological knowledge and principles to the solution of educational problems, especially learning. Educational technology implies the use of the following to improve the quality of education. (i) All Educational Resources (including research information on human learning and communication principles) and (ii) Planning Strategies
Educational technology has its developmental roots in audio-visual movement, research findings and theories of communication as well as the psychology of learning. Therefore educational technology can be explained from the views of Dib (1980) when he reported that educational technology can be described from three perspectives:

(a) As an assembly of technical materials and resources.
(b) Use of mass communication system
(c) An application of certain psychological models and principles under ideal learning conditions for facilitating learning.

When educational technology is considered as an assembly of technical materials and resources, it refers to mere tools for education. The learners within a given instructional process are never considered in the design, production, selection, use and evaluation of such resources. Those materials are mere complements of the teaching-learning process and are rightly called teaching aids which are not integral components of any instructional process.

From the perspective of the use of mass media communication system, educational technology involves the use of certain communication models and principles to explain the teaching-learning process. The nature, composition and transmission of information are emphasized. There is a concrete analysis of the characteristics of the learners who constitute the audience. Some aspects of transactional communication are implied because the concept of meaningful interpretation is emphasized. The perspective of educational technology like the audio-visual movement, is deficient because how the learners process information and the conditions for such learning are not specified. The use of mass communication system is merely a component of educational technology.
Application of the psychology of learning theories, principles and models uses the principles of instruction, curriculum and learning to explain educational technology. The information processing theory of learning and the conditions for learning to occur become paramount. Instructors can think of how they can provide instructional functions of managerial and appraisal activities for the substantive activities to be learned.

To achieve this, educational technology must be seen as the systematic integration of materials, communication system and the psychology of learning. Educational technology therefore, involves the process, product and process-product dimensions of providing qualitative education to enhance improved performances.

**Concept of Educational Technology**

The concept of educational technology is described as follows:

1. Educational technology cannot be taken as a synonym to audio-visual aids or technology in education emphasizing the concept of service ie. the use of different equipments, gadgets and mass media.

2. Educational Technology must mean technology of education which presents as a system for bringing improvement in the total process of teaching learning. It involves carefully analysing the problems and reorganising all available resources in an economical way for the optimum results.

3. Educational technology cannot be viewed in terms of its parts or processes. Instructional technology, teaching behaviour, programmed learning, micro-teaching, system analysis, management of teaching learning, teacher or pupil behaviour, etc., are all its constituents and resources. No one alone is enough to represent the concept of educational technology. All these branches, innovations, approaches and strategies should
be integrated as a whole according to the needs and requirements of the system represented by educational technology at a particular time in a given situation for accomplishing its useful objectives.

Objectives of Educational Technology

Educational technology in the capacity of technology of education provides valuable help in the total teaching-learning process for achieving the best possible results in an economical way through the available human and non human resources.

The objectives at the macro level are as follows:

1. To identify educational needs and specifications of the community.
2. To determine the aims of education, broad strategies and structure of education.
3. To develop a suitable curriculum with interaction of science, art and human values.
4. To identify man-material resources and strategies for achieving the stipulated aims of education.
5. To develop certain models leading to improve the process of teaching and learning.
6. To develop the appropriate aids and equipments to meet the educational purposes.
7. To identify the major constraints in the environment and the ways and means to tackle them.
8. To help in extending educational opportunities to masses especially neglected sectors of the community.
9. To manage the whole educational system covering planning, implementation and evaluation phases.

Objectives at micro level are as follows:

1. To identify and analyse the characteristics and educational needs of the pupil.
2. To determine the specific class-room objectives and state them in behavioural terms.

3. To analyse the contents of instruction and organise its proper sequence.

4. To identify the available teaching-learning material and resources.

5. To identify the nature of the interaction of the sub-systems like students, teachers, teaching-learning material, content of instruction and methodologies.

6. To plan the teaching strategies and utilize the man-material resources for the attainment of specific classroom objectives.

7. To evaluate the effectiveness of the classroom teaching in terms of pupils' performance or change in behaviour.

8. To provide appropriate feedback to the pupils as well as teachers to bring modification in the teaching-learning process.

Definitions of Educational Technology

'Educational Technology' may be taken to mean the systematic application of technological knowledge and development of electrochemical devices to the field of education towards the attainment of practical goals, improving efficiency of teaching and learning. Educational Technology comprises a combination of 'technology in education' and 'technology of education'. Technology in education refers to the study of the use of different media such as video/audio visual aids and equipment like slide projector, computer, television etc., to make teaching more effective. Technology of education refers to the study of principles, theories, formulae etc. to solve problems in the teaching-learning or training process. The main framework of educational technology is provided by 'technology of education' whereas 'technology in education' provides the support to implement the broader instructional design. It primarily implies a systematic approach to instructional design incorporating alternative methodologies, media and aids with reference to the objective vis-a-vis learning content.
Educational Technology has been defined by many people. Some of the important definitions are as follows:

UNESCO (1969) defines,

(a) Educational technology is concerned with the development, application and evaluation of systems, techniques and aids to improve the process of human learning.

(b) Educational technology could be conceived as a science of techniques, methods and media by which educational goals could be realised. It is not primarily concerned with the task of prescribing the goal although it does not help in specifying the goals and translating them in behavioural terms.

(c) Educational technology is a communication process resulting from the adoption of the scientific method to the behavioural science of teaching/learning. It is a communication process which may or may not require the use of extending media (ie. broadcasting, television, film and other audio-visual media). The process contains essentially the following components:

(i) Specification of goals and behavioural objectives.
(ii) Analysis of the characteristics of the learner.
(iii) Selection and organisation of the content of subject matter to be learned.
(iv) Mediation and presentation of the content.
(v) Evaluation of the results.
(vi) Feedback: feedback must be continuously interacting among all of the preceding five components, it is not just a final component, but it provides essential linkage among all the components.

According to Gases (1971), "Educational technology has to be seen as part of a persistent and complex endeavour of bringing pupils, teachers and technical means together in an effective way".

Encyclopedia of Education (1971) explains that educational technology is the purposeful combination or separation, of objects, techniques, devices, events and relationships to increase the effectiveness of the educational process.
AECT (1972) accepts, "Educational Technology" is a field involved in the facilitation of human learning through the systematic identification, development, organisation and utilization of a full range of learning resources, and through the management of the process. It includes, but is not limited to, the development of these instructional systems, identification of the existing resources, the delivery of resources to the learners, and the management of these process and the people who perform them. Its functions are shared in varying degrees by all who are concerned with its purpose, the facilitation of human learning. However, a reasonably clear uniqueness of and boundary for the field can be defined in terms of the dominant beliefs and special approaches of its practitioners.

The Report of the Technical Working Group for Educational Technology in Asia under APEID explains, with special reference to the developing countries in Asia: "Educational Technology is seen both as a means as well as service to effect and facilitate better and productive learning systems. It is an integral part of both formal and non-formal education. One aspect of educational technology is related to the use of specific techniques such as ETV, radio, programmed learning and other audio-visual aids. In another aspect, educational technology is seen as the application of scientific and other organised knowledge to the practical problems of Education. In the particular context of developing countries the emphasis is on the application of techniques and knowledge with a view to mobilising and optimising the available human as well as technological resources".

UNESCO/UNDP (1976) explains educational technology as "Educational Technology may be defined as a separate field in the theory of education dealing with the
AECT (1972) accepts, "Educational Technology" is a field involved in the facilitation of human learning through the systematic identification, development, organisation and utilization of a full range of learning resources, and through the management of the process. It includes, but is not limited to, the development of these instructional systems, identification of the existing resources, the delivery of resources to the learners, and the management of these process and the people who perform them. Its functions are shared in varying degrees by all who are concerned with its purpose, the facilitation of human learning. However, a reasonably clear uniqueness of and boundary for the field can be defined in terms of the dominant beliefs and special approaches of its practitioners.

The Report of the Technical Working Group for Educational Technology in Asia under APEID explains, with special reference to the developing countries in Asia: "Educational Technology is seen both as a means as well as service to effect and facilitate better and productive learning systems. It is an integral part of both formal and non-formal education. One aspect of educational technology is related to the use of specific techniques such as ETV, radio, programmed learning and other audio-visual aids. In another aspect, educational technology is seen as the application of scientific and other organised knowledge to the practical problems of Education. In the particular context of developing countries the emphasis is on the application of techniques and knowledge with a view to mobilising and optimising the available human as well as technological resources".

UNESCO/UNDP (1976) explains educational technology as "Educational Technology may be defined as a separate field in the theory of education dealing with the
development and application of the use of educational resources. In detail it implies the following principles:

1. Clear educational objectives; 2. Logical order of the elements of the content; 3. Structure of the teaching-learning process; 4. Development of 'models' leading to the acquisition of knowledge; 5. Introduction of feedback with the teaching-learning process; 6. Media selection and criteria of media selection; also evaluation and optimization; 7. Development of equipment that meets educational, economic, aesthetic and technical demands; 8. Study of the effectiveness of hardware and software in practical situations; 9. Various approaches to effectiveness in educational systems

The Fontana Dictionary of Modern Thoughts (1978) explains, "the use of apparatus and machines such as language laboratories, films, slides and tape-recorders, books, television, radio, video-tape and the still cameras extend the teacher's range of effectiveness. In addition, computers have provided a powerful aid over a wide range. Critics of ET warn that, while in skilled hands it may be valuable, casual users may find the machines unexpectedly awkward to work and that teachers must not let the machines dominate their teaching responsibility. Its supporters argue that it is intended as an aid and not a substitute for teaching and that in any case children are going to grow up in a technological world and should learn how to use and evaluate technological techniques".

International Encyclopaedia of Educational Technology (2nd edn.) (1996) sees educational technology "as a problem-solving process, concerning most aspects of teaching and learning through media and technology, in the context of education and training. Problems may arise in subdomains of education, such as curriculum, instruction and learning, methods and media, or organization and management. In developing solutions, use will be made of many technologies in the narrower meaning of the word - educational aspects and applications of information and communication technology".

**VIDEO ASSISTED INSTRUCTION**

In recent years we have seen that media assume an increasingly important role in every aspect of instructional planning and design. The process began with the use of
visual aids in support of instructor-centered teaching, when we frequently see audio visual
and audio, video media assigned centre-stage prominence, especially for learner
individualized self instruction and remote access individualized instruction.

Technology transfer to the rural people can be taken effectively and quickly by the
mass media. Television as one of the mass media can play a significant role in transfer of
technology. The communication revolution has brought in its wake a tremendous
transformation, both structural and functional, in the society as a whole. It is considered
to have the most exciting and efficient potentials of influencing our thoughts and actions.
Unlike radio broadcast, where only the sound is transmitted, television transmission has
the added advantage of all the important visual experience which are made more dynamic
and meaningful by the movement and sound associated with the visual experience.
Telecast makes the masses conscious of new technology, plans and social awareness,
developments, programmes etc.

The television experience, which is a combination of sound and picture received
instantaneously on the TV screen, comes closer than any other contrived experience to
that of reality. It makes it possible for the talents of the best teachers to be put at the
disposal of all scholars. TV can employ all other audio and visual aids and combine their
effectiveness in the air medium. Pictures, charts, films, micro slides, graphs, boards,
overhead projector can all be employed in the technique of teaching by TV.

In instruction, TV can be advantageously used to:

- broaden and enrich the instructional learning experiences of the learners.
- create genuine interest in the topic or the subject that is being taught.
- elevate the quality of classroom teaching process.
- provide a wide variety of experiences that are quite different from the
  routine instruction.
- stimulate less passive slow learners by developing a more critical approach in them.
- provide opportunity to learn, to create productions that can improve students ability to communicate.

DEFINITION OF TERMS

The different instructional strategies viz. Lecture Method, Conventional Non-Interactive Video, Instructor Controlled Interactive Video introduced as experimental intervention in this study are defined/explained as follows:-

Lecture Method (LM)

The lecture method is found to be one of the chiepest methods of instruction even after the availability of the media like computers, TV, etc. The reasons for the success of this method are interaction between the learners and the teacher, usage of apt language, mannerism, wit and humour, skill of drawing the attention of the audience, explanation and exposure of the concepts in coherent manner etc. It is a flexible method as instructors can adopt themselves to the subject matter, achievement level of learners, time limit, available apparatus and equipment and all these in a very short notice. While lecturing, the instructor can get reinforcement from the learners in terms of their attention. Learners' attention and interest can be captured by instructor's wit and humour, non-verbal communications such as gestures, posture and movement, logical statements and enthusiasm. The physical environment of the lecture hall itself may give security to some learners as they are doing the right thing by being present along with their co-learners at the right place, at right time and respond to the instrurctor in one way or other. The learner's gaining knowledge and comprehending the subject-matter, lectures also provide group feelings, social reinforcement and emotional security. These are the advantages of the lecture method.
Conventional Non-Interactive Video (CNIV)

Video technology has a greater potential for the transfer of technology and development of human resources. The Video Cassette Recorder is an electronic device for recording and playing the video consisting of visual and audio elements of a programme. It has a great potentiality to capture and store messages from TV. It can be used to produce developmental programmes at a cheaper rate as compared to film. It can control the audience by the way of using moving images, music sound effects and graphics. Information traditionally presented in the form of booklets and handouts can be rendered more effectively through video. However it fails to make interaction with the audience due to its one way communication. The audience remain to be passive spectator throughout the video programme. It is evident that effective learning takes place when better interaction prevails between the teach and the taught during teaching-learning process.

Instructor Controlled Interactive Video (ICIV)

Interactive video combines the strengths of both computer and video to give an amazing teaching tool that allows individual self-paced, self-directed, self-controlled and fully illustrated instruction. Interactivity takes place between the user and the system. The huge storage capacity of information in all forms such as still, motion, text, analog, digital, music, speech, audio and interactivity are some of the advantages of interactive video. This western model is not only costly and skill oriented but also individualized in instruction. This model may not suit to developing countries for they need group learning system in order to minimize the expenditure.

Instructor Controlled Interactive video, the indegenous model can best suit to our conditions in which the instructor can replace the computer and make the learner group watch and record their interaction by responding to the questions asked by the insructor
intermittently. The ICIV, can pay rich dividend in terms of learning outcomes. Feedback could be given to the learners for their responses through the video controlled by the instructor.

EXTENSION EDUCATION IN AGRICULTURE

Extension education has a long and distinguished history as a discipline, profession and an applied behavioural science. It has achieved great respect and confidence in the entire rural community. It has successfully helped the filed workers and academicians in the growth of various disciplines, as well as in programmes of activities related to human improvement.

According to Leagans, (1961), "Extension education is an applied science consisting of content derived from research, accumulated field experiences and relevant principles drawn from the behavioural sciences synthesized with useful technology into a body of philosophy, principles, content and methods focussed on the problems of out-of-school education for adults and youth.

In our country the word 'Extension' is used to mainly for three different aspects of extension work - the job, the agency (or organisation) and means (or process). Many workers and lay people feel that agricultural extension is merely the process of providing the farmers with the supplies and services required by them for increasing production.

Agricultural extension is concerned with agricultural education in assisting farmers to bring about continuous improvement in their physical, economic and social well being through their individual and co-operative efforts. It makes available to the farming community the scientific and other factual information and training and guidance for the solutions of the problems in agriculture including animal husbandary, gardening,
agricultural engineering etc. Extension education is needed not just an extension, it is an
intimate part of an entity, a force much greater than itself. This force is very dynamic in
nature and that is why it has established a deep-rooted and happy relationship with
majority of the biological and social sciences.

INTERACTION ANALYSIS

In our country classroom teaching continuous to be the most common form of
instruction for many more years. Barker (1982) says that the teacher initiated 55.2 per
cent to 80.7 per cent of all the messages in the classroom. The communication cycle is
initiated by the teacher as a result of teacher's need to impart information or the students'
need to seek information. According to Nathall and Snook (1973) instructional activities
of a classroom can be categorised into three basic forms.

1. Individual work which accounts for 25 to 45 per cent of class time.

2. Extended discourse which accounts for 18 to 22 per cent of class time. The
teacher is found to be talking, performing, demonstrating or exhibiting materials
most of the time in this activity.

3. Interactive discourse which accounts for 34 to 53 per cent of class time when
teachers and students are talking with each other.

The act of teaching is a kind of reciprocal contact established between the teacher
and pupil. The reciprocal contact can be perceived as a series of events which occur one
after another. Classroom interaction refers to this chain of events, each one of which
occupies a small sequence of time.

An event may be defined as the shortest possible act that a trained observer can
observe and record. In a normal class, the same sequence of events occurs again and
again. Such a sequence may be called a pattern. Various techniques are used for studying
the chain of classroom events. A trained observer sitting in the classroom can keep a
record of the flow of events on an observation form using a set of categories. An analysis can be made of the frequency of each category and a profile of the distribution be drawn.

The same principles can be applied in analysing the interaction patterns that emerge as the result of interaction among the instructor, the learners and the media in agricultural extension programmes also.

**TAXONOMY OF EDUCATIONAL OBJECTIVES**

Education as a matter of fact is a process of bringing about changes in the individuals in desired directions, i.e. enabling them to perform certain skills, to develop certain understanding, interests, attitudes, etc., to add to their stock of knowledge and ultimately to lead them to a happy, productive and socially acceptable life. Evaluation on the other hand is a process of ascertaining the nature and quantum of change and should necessarily be based on or be directed towards such goals.

Learning takes place when the learners achieve what the instructors perceive as essentials to be achieved while a course or a unit of a course is taught in the learning centre. In order to know if learning has actually taken place, the instructors should be clear about what they perceive as essential and how they expect the learners to learn i.e. the objective of teaching must be specifically defined so that the instructors keep those as frame of reference to find out if learning has taken place and if so, whether their instruction has been effective. It implies, therefore, that effectiveness of teaching is the outcome of adopting appropriate instruction technique to help learners achieve these objectives and of an appropriate evaluation to find out if learning has taken place. It follows that instructional objectives, instructional strategies and evaluation are the three salient features of effective instruction which indicates effective learning.
The instructor has to generate the instructional objectives from the curriculum of a particular course and use this as the guidance for teaching. To the extent that these instructional objectives are made specific, observable and measurable and are adequately expressed in operational terms, the choice of appropriate teaching strategies and evaluation becomes easier.

The first step towards formulating objective based instructional design is to have a clear concept of instructional objectives expressed in terms of learner behaviour. This can be done by analysing each of the general objectives into specific objectives. A number of models of objectives have since been developed. The most convincing of these in the recent years has been the taxonomical model of educational objectives developed by Bloom (1956) and his associates. It has adopted to tripartite division corresponding to the three primary aspects of pupil growth-cognitive, affective and psycho-motor (knowing, feeling, doing).

**Cognitive Domain**

The cognitive domain represents the intellectual components of mental life and is certainly the most basic one from the point of view of education. This category consists of cognitive or thinking abilities. The six levels of learning in this domain are:

1. **Knowledge**: Knowledge is the lowest level of cognitive learning. Knowledge is taken to involve the recall of specifics, universals, methods, process, patterns, structures, settings, generalizations etc. The basic psychological process in use is remembering. This is distinguished from the remaining five which are together called intellectual abilities for the simple reason that the latter requires "Organised models of operations and generalized techniques for dealing with materials and problems".
2. **Comprehension:** Comprehension which is next higher in the category of objectives is concerned as the lowest level of "Understanding" equivalent of knowing what is being communicated and using the material or idea communicated without necessarily relating it to other material or seeing its fullest implications.

3. **Application:** Application is the middle level objective of cognitive domain. It pertains to "the use of an abstract idea in a particular and concrete situation" and thereby arriving at a solution of a problem. There may be some difference of opinion about the limited scope of this objective and as such the use of the term 'application' for it. This may be defended on the ground that the word may be given an ad-hoc meaning by defining it adequately to cannote the use of acquired knowledge in unfamiliar situations.

4. **Analysis:** Analysis is the fourth category and cannotes the breaking down of a communication into its constituent elements in a way that relationships or sequence or both of the components of a set of ideas are made clear. Some people treat it as an equivalent of the objective of critical thinking which is only partly true. Analysis is an important component of critical thinking but the later is something more. Analysis may lead to the identification of elements, relationships or principles.

5. **Synthesis:** In synthesis, all the elements are analysed in such a way that they form a pattern or structure. By combining and organising the elements a unique whole emerges. This objective enables to develop creative ability among students.

6. **Evaluation:** Evaluation crowns all the categories and calls for the most complex mental process necessary for judging a material, method or communication against a standard, internal or external to it.
The objectives of the cognitive domain have been limited to the first three of the steps of Bloom's taxonomy, viz., knowledge, understanding and application with analysis, synthesis and evaluation compressed into application. This has been done because the average instructor is likely to find it difficult to discriminate between them and consequently to tackle them either for purposes of teaching for realising them or for evaluating them with the precision with which they have been originally enunciated by Bloom.

NEED FOR THE STUDY

Agricultural extension can be regarded as the most logical, scientific and systematic method of disseminating knowledge and skills to farmers to aid them in successfully adopted innovation and making the most efficient use of their land and allied resources. Mass media having the potential to widen horizons, to focus attention, to raise aspirations and to create a climate for development can be exploited for transmitting the ideas and techniques from lab to land. However the value of a new communication technology lies not only in its economic viability and its technical soundness, but in its adoption to the local, social and cultural environment also. A piece of technology may be viewed as appropriate for a society, if its design is related to the real and felt adoption needs of that society and its use fulfills these needs. It is known that one of the potential instructional media in agricultural extension programmes is Instructor Controlled Interactive Video. It is imperative to establish its effectiveness in realising the instructional objective among farmers in agricultural programmes and hence this study.

STATEMENT OF THE PROBLEM

All India Conference on Agricultural Education (1969) strongly recommended that appropriate media should be availed to stimulate the participants in the teaching-learning process in agricultural extension. Interaction is an important aspect in the
teaching-learning process. Interactive Video fulfils the need for the interaction in the teaching-learning process by means of the computer. The same effect can be produced by the Instructor Controlled Interactive Video also in the teaching-learning process through the instructor. In order to establish the effectiveness among different instructional strategies viz. LM, CNIV and ICIV in modifying the cognitive behaviour among farmers in agriculture the investigator has taken up the study on "Effectiveness of Instructor Controlled Interactive Video as Compared to Conventional Non-interactive Video and Lecture Method in Modifying the Cognitive Behaviour Among Farmers in Agriculture".

SCOPE OF THE STUDY

The relative effectiveness among different instructional strategies viz. LM, CNIV and ICIV in modifying the cognitive behaviour among farmers in agriculture was established in this study. The relative effectiveness among different instructional strategies in realising the instructional objectives in agriculture in the context of varying difficulty levels of the contents as well as varying formats of the video programmes was also established. An attempt was also made to compare the different interaction patterns which occurred as the result of interaction among the instructor, learners and the media in the teaching-learning process between ICIV and LM as different instructional strategies. The video programmes availed in the study were evaluated by a team of experts and others using a specially developed evaluation proforma. In conjunction with other 'Process product' studies in extension education, this study also contributes to the knowledge of effective instructional media in agricultural extension.
OBJECTIVES OF THE STUDY

a. Primary objectives

The primary objectives of the study are as follows:

1. To find out whether the different instructional strategies viz. Lecture Method (LM), Conventional Non-interactive Video (CNIV) and Instructor Controlled Interactive Video (ICIV) have any effect in modifying the cognitive behaviour at different levels viz. knowledge, understanding and application among farmers in agriculture.

2. To establish the relative effectiveness among different instructional strategies viz. LM, CNIV and ICIV in modifying the cognitive behaviour at different levels viz. knowledge, understanding and application among farmers in agriculture.

3. To establish the relative effectiveness among different instructional strategies viz. LM, CNIV and ICIV in modifying the cognitive behaviour among farmers in agriculture in the context of the contents with varying difficulty levels.

4. To establish the relative effectiveness among different instructional strategies viz. LM, CNIV and ICIV in modifying the cognitive behaviour among farmers in agriculture in the context of programmes with varying formats.

5. To establish the relative effectiveness among different instructional strategies viz. LM, CNIV and ICIV in terms of retention as revealed by the participants' performance in the retention test.

6. To establish the relative effectiveness between Documentary and Straight Talk as different formats of the video programmes in terms of retention as revealed by the participants' performance in the retention test for different instructional strategies.

7. To ascertain the relative effectiveness between CNIV and ICIV as different instructional strategies in terms of retention as revealed by the participants' performance in the retention test for the different formats of the video programmes.
b. Secondary objectives

The secondary objectives of the study are as follows:

1. To study the interaction patterns that occurred in the groups of LM and ICIV as the result of interaction among the instructor, the participants' and the media.
2. To develop two parallel objective based achievement tests in the selected content areas of the agricultural video programmes.
3. To develop an evaluation proforma to validate the agricultural extension video programmes availed for the present study.

HYPOTHESES OF THE STUDY

The hypotheses of the study are stated as follows:

1. There is significant difference between the means of pre and post test scores of the participants of the different instructional strategies viz. LM, CNIV and ICIV at all levels of cognition in agriculture.
2. There is significant difference among different instructional strategies viz. LM, CNIV and ICIV in their effectiveness in modifying the cognitive behaviour at all levels among farmers in agriculture.
3. There is significant difference among different instructional strategies viz. LM, CNIV and ICIV in terms of their effectiveness in modifying the cognitive behaviour among farmers in the context of varying difficulty levels of the content in agriculture.
4. There is significant difference between CNIV and ICIV as different instructional strategies in terms of their effectiveness in modifying the cognitive behaviour among farmers in the context of varying formats of the video programmes in agriculture.
5. There is significant difference among different instructional strategies viz. LM, CNIV and ICIV in their effectiveness in terms of retention as revealed by the participants' performance in the retention test.

6. There is significant difference between Straight Talk and Documentary as different formats of the video programmes in terms of retention as revealed by the participants' performance in the retention test for different instructional strategies.

7. There is significant difference between CNIV and ICIV as different instructional strategies in terms of retention as revealed by the participants' performance in the retention test for different formats.

8. There is significant difference between the means of post and retention test scores of the participants of the different instructional strategies viz. LM, CNIV and ICIV at all the levels of cognition in agriculture.

9. There is significant difference between LM and ICIV as different instructional strategies with regard to different interaction patterns occurring as the result of interaction among the instructor, participants and the media during teaching-learning process.

TOOLS USED IN THE STUDY

The following tools were used to collect the required data in this study.

1. An interview schedule was developed by the investigator to know the demographical variables, experience in agricultural practices and mass media exposure of the participants.

2. Fifteen selected need based video programmes in agriculture developed by the Directorate of Extension Education, Tamil Nadu Agricultural University, Coimbatore were used for instructional purpose in this study.
3. Two parallel objective based achievement tests in the selected content areas in agriculture were developed and standardised by the investigator. Each of the test is comprised of 150 items with a break of 75 knowledge items, 35 understanding items and the remaining 40 application items.

4. An evaluation proforma was developed by the investigator to validate the video programmes availed in the study from technical and pedagogical points of view.

5. Modified version of Flanders Interaction Analysis Categories System was used to analyse the interaction patterns that occurred as the result of interaction among the instructor, the participants and the media in the groups of LM and ICIV.

METHODOLOGY OF THE STUDY

Pre-test Post-test Non-Equivalent Groups Design was found to be the most appropriate method for testing the formulated hypotheses in the present study. Three groups each of 50 farmers were formed from three villages of the Kanyakumari District of Tamil Nadu. The entry behaviour of the farmers of all the three groups in the selected content areas of the agriculture programmes was found out as measured by the pre-test in the said content areas. One of the groups was treated as Control Group while the other two groups were treated as Experimental Groups. LM was adopted in the Control Group, while CNIV and ICIV were adopted as experimental interventions in the Experimental Group I and Experimental Group II respectively.

Fifteen video programmes in different content areas of agriculture themes developed by the Directorate of Extension Education, Tamil Nadu Agricultural University, Coimbatore were availed for instructional purpose in the Experimental Groups. The same themes were introduced to the Control Group through Lecture Method using appropriate audio-visual aids. The interaction patterns that occurred as the result of interaction among the instructor, the participants and the media in the Control and Experimental Group II
were studied using the modified version of Flanders Interaction Analysis Categories System. The ratios representing different interaction patterns were computed using appropriate formulae for each of the programme for both Control and Experimental Group II. The mean and SD of the scores of the ratios representing different interaction patterns for each of the programme were computed for both Control and Experimental Group II.

Two parallel objective based achievement tests in the said content areas were developed and standardised. One of these tests was administered as pre-test and the other was administered as post-test to all the three groups before and after the experimentation. The same test which had been given as post-test was again administered as retention test to all the three groups one month after the administration of the post-test.

An evaluation proforma was developed taking care of each and every aspect of the production of video based instructional material. All the video programmes availed for instructional purpose in this study were evaluated by a team of experts using the said proforma. The reliability and validity of the achievement tests used as pre and post tests were established following appropriate procedures.

The mean and SD of the scores of the participants as measured by the pre, post and retention tests were computed for all the three groups. The formulated hypotheses were tested using appropriate statistical techniques.

**DELIMITATIONS OF THE STUDY**

The delimitations of the study are as follows:

1. Though the need of the farmers for programmes on agricultural themes was vast, only a few themes were selected for instruction due to want of time and money.
2. The homogenity of the Control and Experimental Groups was established only with respect to the scores of the participants on the pre-test. The intervening variables like anxiety, fatigue, motivation, intelligence etc. were not taken into consideration while establishing the homogenity of the Control and Experimental Groups.

A BRIEF RESUME OF THE SUCCEEDING CHAPTERS

A conceptual framework with respect to video media in instruction is given in the chapter II.

An account of some of the previous studies related to the present investigation conducted in India and abroad is given in the chapter III.

The IV chapter deals with the methodology adopted in the study describing the different tools used in the study, profile of the samples comprising control and experimental groups, conduct of the experiment, validation of the video programmes availed in the study and establishment of the reliability and validity of all the tools used in the study.

The V chapter deals with the analysis and interpretation for data along with the hypotheses testing.

The VI chapter summarises the findings and conclusions of the study and provides recommendations for effective use of video in agricultural extension programmes along with suggestions for further research in the same area.