Introduction of educational technology

Meaning of educational technology

The use of technology in the field of education is edn^al technology.

Teaching (purposeful activity) → Aims & objectives

Developments in edn^al tech. or evolution of edn^al tech.:-

Previous days → teaching → oral

Later days → teaching → written → script is developed.

→ After the invention of printing press - text books, learning material came into use.

→ Present days → Radio, tape-recorder, T.V. → electronic gadgets or audio visual aids.

→ Olden days → chalk, slate, B. Board
→ simple charts, simple text books.

→ In 1873 at Vienna → an exhibition for T.L.M - recognition of audio visual aids or materials - Then everyone realised this importance.

→ In 1960 - America - teacher's scarcity - B.B.C (in place of teacher)

→ In 1960 → with the devl. of T.V - many ways of edn. Later computer - edn.

Technology of teaching:-

1. Micro teaching
2. Team teaching
3. Self or individualised learning

→ In the earlier days, parent is responsible for educating the child (not only academic but morals at house also)

→ Later it is shifted from parent to the teacher - from home to school.

→ To achieve aims & objectives, the teacher started using technology (less time, less consumption of energy, better understanding)

Technology in Edn

1. Use of audio-visual aids → hardware.
2. Micro teaching - teacher trainee - to develop skills
3. Self or individualised learning - programmed learning - [illegible]
4. lesson plan - instructional objectives
5. Task analysis

→ It should be done in systematic approach or [illegible] approach → Teaching - teacher - learning - how learning takes place - learner - qualities of a teacher → [illegible] is Task Analysis.

Different Views of Edn'al Tech:-

* "Application of physical science & engineering principles providing tools & instruments for effective teaching - learning or in the process of teaching-learning." — James [EJ1]

* "Application of scientific principles to instruction
→ Here psychological principles of learning are given more importance [Motivation, instructional objectives - software approach intellectual aspect.]
→ interaction between two living things. — Skinner & Gagne [EJ2]

* Systems Approach [EJ3]

"Education is done in a systematic way or manner" — Davis & Heartley

→ Hardware approach → EJ_1
→ Software approach → EJ_2

Definitions of Educational Technology:-

→ According to G.O.M. Leith, "Edn'al Tech. is an application of scientific knowledge about learning and conditions of learning to improve the effectiveness and the efficiency of teaching and learning."

→ According to C.C. Kulakowni, "An application of the last as well as recent discoveries of science and technology to the process of edn."

Laws & principles → recent discoveries

In Teaching
5 M's
major role

- Men
- Method
- Material
- Machine
- Media

characteristics

Nature of edn tech:

1. Application of scientific principles to the field of edn.
2. It gives importance to the development of new methods & teaching to make teaching-learning more effective.
3. It organises the learning environment (learning effective)
4. It emphasises development of measuring instruments for feedback. (evaluation)
5. It facilitates learning by controlling men, methods,
6. material and environment.
6. It not only use of A.V. Aids but also it involves systems approach
7. It involves input, output & process. (systems approach)
8. It is an effective medium of communication.

Scope of edn tech:-

1. Analysis of the process of teaching - learning
   should analyse → what is teaching?
   what is learning?
   How learning takes place?
2. Spelling out the edn goals → all round devl.. of the child - goals may vary depending upon the need of the society.

5 Devp. of curriculum :-

Prepares the curriculum according to the set goals

4 Devt of Teaching-learning material :-

NCERT's Edtal Tech. department develops/provides C.D's, ppt, teaching-learning material etc.

5 Production of well-trained teachers :-

Effective training by arranging in-service training programmes etc.

6 Devt. of evaluation tools for feedback :-

Accurate methods or tools & techniques should be used in the field of edn for feed back.

Differences between hardware and software approach

	Hardware		Software
1.	Origin from physical sciences & applied sciences engineering	–	Origin from behavioural sciences.
2.	Production of A.V. aids	–	use of principles of learning
3.	Product-oriented approach	–	process oriented
4.	Service based. provides service	–	It gives indirect service
5.	Provides service to edn &	–	cannot educate many people
5.	Many people can be educated		
6	Eg: Radio, T.V./ It requires software also	–	It also requires hard ware
6.	It develops/requires efficiency of software of the teacher	–	sometimes individual program.

Significance of edn. Technology (Need & importance of use)

1. To get better understanding.
2. To save time and energy.
3. For better retention or long time memory.
4. To improve the standards of edn.
5. Right concept formation.
6. To educate students (growth in population) by using technology other than formal way of edn.
7. To expand the students' knowledge (knowledge explosion) → using of internet.
8. To provide non-formal edn. or distance edn.
9. To educate the people from different fields.

Micro teaching :- (Brief History)

* Modification of teacher's behaviour.
* Observation
* Interaction analysis
* Teaching is science → systematic way of doing things or acquiring knowledge.
* Teaching is also an art → skills.
* Education system is based on the scientific approach
* In 1960 the concept of micro teaching was developed → center for Research and Development at Stanford University.
* 1963 → Dwit Allen - Micro teaching name.
* R.N. Bush used tapes for recording.
* In India - 1967 - D.D. Tiwari.
* It is more developed in Madras at Technical Training Institute
* The first book in India on Micro Teaching is "Modification of Teacher's behaviour through Micro Teaching" by N.L. Dosajh.

→ 5 R's → Recording → Voice - Tape recorder.
A.V - Video record
Reviewing
Responding
Refining
Redoing

* It is a cyclic process (until perfection of skill)

Definitions :-

(1) According to D.W. Allen, "It is a scaled down encounter in class, size and time."

(2) According to R.N. Bush, "It is a teacher education technique which allows teachers to apply clearly defined teaching skills to carefully prepared lesson plan in a planned series of 5 to 10 minutes encounter with a small group of pre-test students often with an opportunity to observe the result on a video tape."

→ Feed back is given by tape recorder, video tape, CC T.V, Teacher Educator, peer group etc.

Micro teaching →

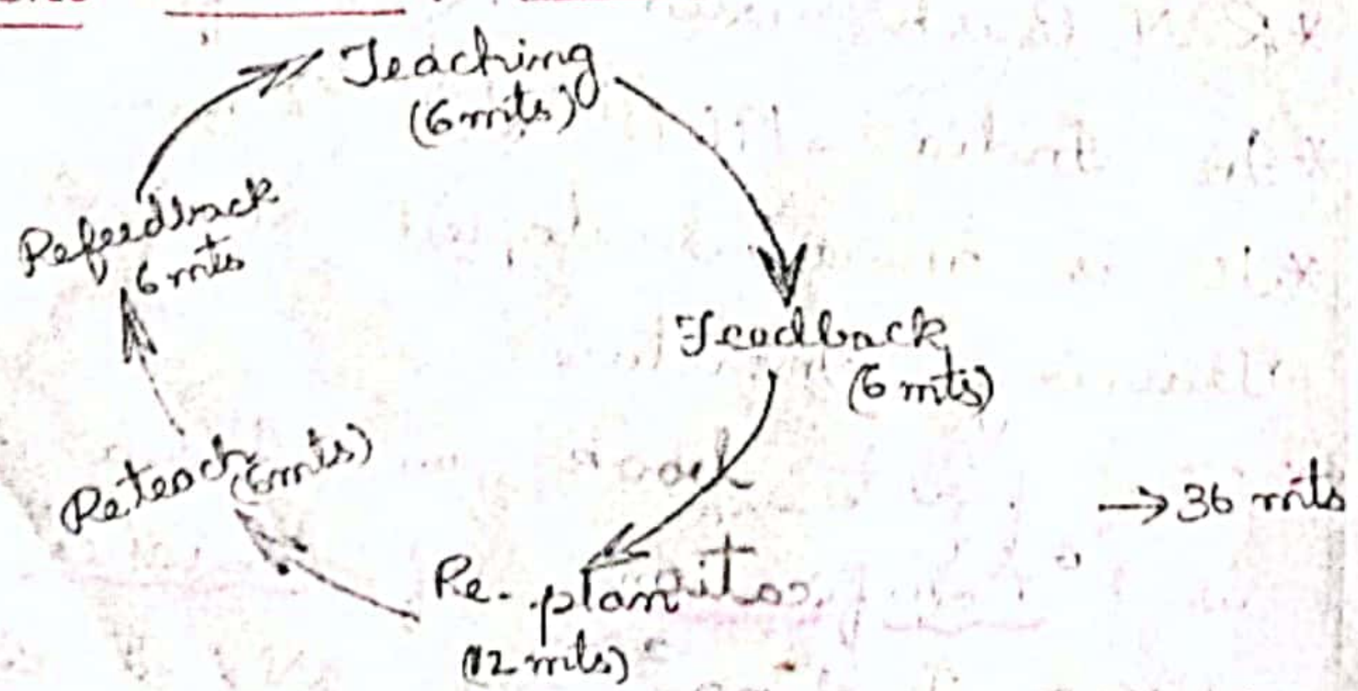
No. of pupils : 5 to 10

Concept : single concept.

Duration (Time) : 5 to 10 min.

Skill : Single skill.

MICRO TEACHING CYCLE



Phases of microteaching :-

(1) Knowledge acquisition phase → Demonstrations → Proactive phase.

(2) Skill acquisition phase → Interactive phase → individual skill.

(3) Transfer phase → Integration of skills and transfer into real classroom situation.

No. of pupils → 50 to 60

Time → 45 mts.

No. of concepts → 3 or 4

Skills → Drawing, Explaining, Questioning, use of teaching aids.

The above phases are further divided into different phases steps :-

I Phase
(1) Orientation of student-teacher.
(2) Discussion of teaching skills.
(3) Selection of a particular skill and giving demonstration (It is given by teacher-educator)
(4) Observation of demonstration and discussion.

II phase
(5) Selection of the skill by the student-teacher and preparation of lesson plan.
(6) Creation of set for micro teaching (no. of pupils, type of students, selection of supervisor, time duration)
(7) Practice of the skill.
(8) Providing feedback (peer group, supervisor etc.)
(9) Re-plan
(10) Re-teach
(11) Re-feedback

III phase
(12) Integration of skills and transfer into real classroom situation.

* stimulus variation is very important in the classroom. It is the movement of the teacher to make the students attentive.

Definition of skill:

According to N.L. Gage, "Teaching skills are specific instructional activities and procedures that a teacher may use in his classroom."

→ These are related to various stages of teaching

→ Before going to class he has to do somethings related to skills.

→ Having technical skills of teaching specific aspects of teaching behaviour that are considered to be particularly effective in facilitating desired learning particularly in students.

There are different stages in projecting the skills by the teacher in teaching:-

(1) Planning stage:-

→ Selection of content
→ Organising the content
→ Writing the instructional objectives
→ Selection of teaching learning material

(2) Introductory stage:-

→ Creating set for introducing the lesson.
→ Introduction of the lesson.

(3) Presentation stage:-

→ Explaining
→ Use of teaching aids
→ Questioning.
→ Use of black-board.
→ Illustrating with examples.
→ Pacing the lesson
→ Demonstration
→ Management skill (classroom management)

(4) Closing stage :-
→ summarisation
→ achieving closure
→ evaluation
→ giving assignment [purposeful]
→ planned repitition
→ learning difficulties (Identification)
→ Taking remedial measures.
→ Recapitulation.

*N.C.E.R.T identified 20 skills. (out of them some of the components are given below):-

(1) Writing the instructional objectives :- [skill]
→ clarity
→ relevant to the content.
→ adequacy with the level of objectives and with reference to domains.
→ attainability in terms of pupils' outcome.

(2) Organising the content:-
→ Logical
→ Psychological [simple to difficult, known to unknown] etc.

(3) Creating set for introducing the lesson:
→ Components → greeting the students
→ accepting greeting
→ establishing report
→ securing attention
→ ensuring facilities like chalk, duster, teaching material.

(4) Introducing the lesson:-
→ linking with past experiences
→ Link between introduction & main points
→ use of proper or appropriate devices
→ Techniques like questioning, giving examples etc.

(5) Explaining:
→ clarity.
→ continuity between the teaching points
→ relevance to the topic
→ using beginning & concluding statement.
→ covering all important points.

(6) Illustrating with examples:-
→ simple, interesting examples.
→ relevant to the lesson.

(7) Using teaching aids:-
→ relevant to the content
→ according to the level of the children
→ proper discipline
→ appropriate use
→ proper display.

(8) Questioning:-
→ Question delivery & distribution of questions
→ Proper speed.
→ Proper intonation
→ Allowing pause for thinking & questioning.

(9) → Response management:-
→ Management of pupils' responses using techniq
like promoting, eliciting further information
→ refocussing
→ accepting
→ rejecting
→ redirecting

(10) Use of black-board

(11) Assignment

(12) Stimulus Variation :-
→ Body movements
→ change in tone intonation
→ pausing

→ verbal focussing like listen carefully, look at the board, note down

10/9/11 i. Video Tape: V.C.R., V.C.P
→ We can record and whenever it is needed, we can use it

ii. CCTV: Closed Circuit Television.
→ CCTV → only Doordarshan programs.
Importance of CCTV → It can be developed by ourselves
→ Different classes
→ Different schools → expert teachers' demonstrations.
→ Rare and costly experiments & demonstrations.
→ We can use recorded casettes
→ We can develop programs at any time.

Advantages of CCTV:-

1. (i) Teachings
(ii) Demonstrations
(iii) Different activities
} Differg can be shared by different classes & different schools
2. Pupils not not only watch but clarify their doubts by two-way communication.
3. Men, material & resources can be shared by different institutes.
4. Teachers' training - helps for teacher trainees & in-service trainees. [useful for micro & macro-teaching]
5. It helps in administration and teacher educators
6. Helps for to plan the programme according to the needs of the child. and according to time-schedule.

iii Radio Vision:- [visuals]
→ Radio - audio
→ Use of visuals [developed visuals] Eg. film strips, pictures, Teaching - Learning material [relevant to radio]

Radio vision is alternative medium. It is an innovation of radio. Radio is supported with

vision. Sometimes radio programmes recorded on tapes are played there. Vision is supplied with 35 mm filmstrips and set of slides. Teachers' notes also may be prepared. It is a vital part of the package. Illustrations are used to explain, to create interest, to motivate to develop concentration.

Advantages of Radio Vision:-

(1) Production cost is low.

(2) It satisfies the needs of the low achievers, average or medium achievers and also high achievers.

(3) Developing Production of radio vision programme is easy

(4) Modification of sound, vision and subject or information is easy.

(5) Pictures (film or material) once prepared can be used for other subjects and other purposes

IV. Tele-Conference:-

Defini:- An interactive group communication between two or more people in two or more locations through electronic media.

→ First tele conference - 1960's - American Telegraph and Telecommunications [Picturesones]

It may be of three ways.

1. Audio
2. Video
3. Computer

1. Audio :- Extend to person to person telephone call for enabling tele communication among more than two persons at a time.

2 Video :- It involves both audio & video. It helps to communicate both orally & visually making use of T.V & audio system.

3. Computer It involves both audio & visual with the help of computer

Programmed learning

→ Programmed learning was developed by
- B.F Skinner → Operant conditioning theory.
- It is R-S theory. → Behaviour is emitted.

→ classical conditioning theory → S-R theory
→ Stimulus → desired behaviour or behaviour is elicited.
→ good behaviour is reinforced in R-S. theory.

Drawbacks in education:-

1. There is wide gap between reinforcement and emitted behaviour.
2. No serial order in reinforcement.
3. Objectives are vague.
4. The child is studying out of fear.

Programmed Learning → Principles of reinforcements. [main emphasis]
→ Law of effect [Thorndike]

→ Programmed learning helps in self-learning.
→ Psychological principles are involved in this.
→ First programmed learning → geometry → Socrates.
→ Next Tutorial method was developed.
→ After laws of learning, programmed of learning was developed.
→ Example for programmed learning → 'Bhagavad Gita'.

Principles of programmed learning:-

Impt. Terms:-

Stimulus → event or an object in the environment to get desired behaviour.

Feedback → to bring a change in behaviour. It is concerned with physical sci...

Reinforcement → It is a psychological concept. Reinforcement increases the probab... of desired response.

Reinforcer → Anything which has the effect of strengthening the successful behaviour is known as a 'reinforcer'.

Basic principles or psychological principles of programmed learning:- [no teacher - frames are used]

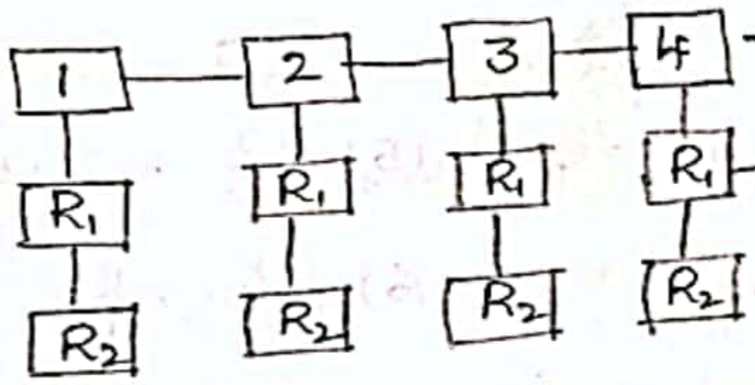
1. Principle of small steps:- concept should be taught in small steps and not as a whole.

Principles	→	Function	→	Symbol
1. Principle of small steps	→	Reading	→	R
2. Principle of active response [answering the question]	→	Writing	→	W
3. Principle of confirmation [checking the answer]	→	checking	→	C
4. Principle of self-pacing	→	Advancing	→	A
5. Principle of student testing [self-testing]	→	Recorder Testing	→	T

Branched Programming

Features:-

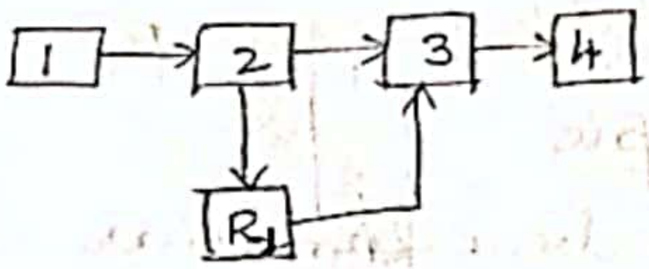
→ Developed by Norman Crowder.
→ Principle is - different learners need different ways
→ It is according to the needs of the students.
→ It is intrinsic.
→ Learner has choice.
→ Large frames i.e more material will be there in frames.
→ Questions will be in multiple choice form
→ 20% of errors.
→ Detection and correction of errors by students.
→ Requires more material & it is more expensive
→ It is suitable for higher classes.
→ No prompts.
→ To teach concept as a whole.
→ It contains main stem and remedial frames.



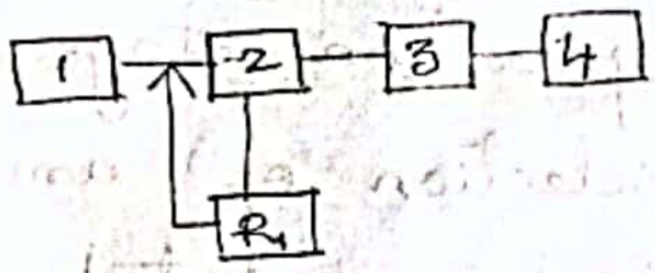
→ main stem (1st branch)
→ remedial frames (2nd branch)

→ Branched programming is of two types.

(1) Forward branching:-



(2) Backward branching.



→ It is controlled by the learner.
→ Understanding the concept is important.

Limitations:-

→ Scope for guessing (because of multiple choice)
→ It requires revision for every two years.
→ It is very difficult to write remedial frame
→ It is expensive
→ It is difficult to write questions on whole ...
→ Requires experts
→ Not suitable to all classes and all subjects.
→ Reinforcement only after completion of task

Differences between linear programming and branched programming.

Linear programming	Branched Programming
(1) Developed by E.F. Skinner.	(1) Developed by Norman Crowder
(2) Main aim - modification of behaviour	(2) Remedial for difficulties in learning.
(3) Scope for 5% errors	(3) 20% errors.
(4) More no. of frames with less matter	(4) Less no. of frames with more matter.
(5) Path controlled by programmer	(5) Path is self-control...
(6) Reinforcement is after every step.	(6) Reinforcement is after completion of the ...

26/1/11

Developing the programmed learning material

1. Preparation stage:-
→ selection of unit or topic.
→ Topic selected must be familiar to the ... suitable to write in programmed learning.
→ small topic
→ writing the main points or outline of the programme.

→ writing the main objective points in terms of behaviour
→ Initial behaviour or entering behaviour.
→ Criterian test for entering behaviour
→ Terminal behaviour (writing and writing the test for terminal behaviour)

2. Writing the programme :-
→ presenting the content in frames.
→ provide for active response of students.
→ provide for confirmation of response.
→ provision of prompts.
→ arranging the frames in sequence.

3. Tryout and Revision :-
→ in a small sample of students.

4. Evaluation :-
→ 10% or less wrong answers for a frame will be continued.
→ 10% or more wrong answers for a frame will be deleted.

Flander's Interaction Analysis

Teacher - student interaction.

(i) Individual work :- Taking attendance, writing something
(ii) Extended discourse :- Doing an experiment, showing
(iii) Interaction :- with different students things.

An act of teacher in the classroom → teacher's behaviour (Def)
Teacher's behaviour → may be lenient, humourous, active, strict, serious always, friendly.
It should not be dominative, integrative → two types of behaviour.

History - In 1920's - Anderson introduced - Bale's - Flander's → easy to observe and analyse.
It is based on the verbal behaviour of teac
We classified 10 categories on the basis of beha

Definition of Interaction Analysis:

"The process of encoding & decoding the study pattern of teaching and learning is interaction analysis.

Interaction analysis technique helps the teacher to analyse and modify the teacher's behavi

10 categories → 7 categories - Teacher talk.
2 categories - student Talk
1 category - Silence.

Teacher talk (7 categories) ⟷ Direct influence of teacher (authe
Steaden Indirect influence of teache (Positive

student talk (2 categories) ⟷ Initiative
Response.

TEACHER TALK:-

(I) Indirect influence of teacher :- Accepts feelings, praises or encourages, using words like go on, very good, yes

(i) Accepts feelings

(ii) Praises or encourages

(iii) Accepts and uses pupil's ideas.

(iv) Asks questions.

(2) Direct influence of teacher :-

(V) Lecturing

(Vi) giving directions → keep silence, note down, look at the board.

(Vii) Showing his authority.

STUDENT TALK:

(i) response
(ii) initiative } 2 categories

(x) silence or confusion → 1 category.

Advantages of Flander's interaction analysis:

(1) Teacher's behaviour can be modified.
(2) gives feedback.
(3) pupils can be grouped.
(4) analysis of classroom situation (or)
(5) understanding the classroom in analytic way.
(6) This technique is reliable and easy to observe.
(7) can study the teaching pattern in the classroom.

Disadvantages of Flander's interaction analysis.

(1) It requires a well-trained observer.
(2) Based on only verbal behaviour of teacher.
(3) No place for activities.

SIMULATION

→ Simulation technique means role playing.
→ It involves Role Perception
Role Playing.
→ It is also known as Role Playing, Pilot training, Teaching in artificial situation, Simulated Social Skills Training (SSST)

Roles(3) in Role Playing (or simulation)

Similar to Micro Teaching

Student - Teacher play the 3 roles.

(1) Teacher
(2) Observer
(3) Pupils

Elements(3) of simulation :-

(1) Diagnosis → of pupils
(2) Prescription → given by teacher.
(3) Evaluation →

Steps(6) in Simulation Technique :-

(1) Assignment of roles.
(2) Discussion of Social Skills.
(3) Preparation of schedule of work.
(4) Determination of observation techniques.
→ what are the things to be regarded.
→ how to interpret the observation.
(5) Organisation of teaching practice.
(6) Alteration of procedure.
→ Alteration of [skill, topic, role.]

Advantages of SSST :- [Simulated Social Skill Technique or Training

(1) Acts as a bridge between theory and pr
(2) Students can study and analyse the teach behaviours.
(3) To study the teaching problems.
(4) To know about the real classroom probl
(5) To find remedies for the problems.
(6) To get self - confidence.
(7) It provides reinforcement for the teachers.

Disadvantages (CSST):-

(1) Elders or student-teachers will play the role of pupils.
(2) Difficult to practice the skill like Questioning.
(3) Student-teachers may not observe properly.

Uses of Simulation:-

(1) To know the class-room manners.
(2) To avoid the risk of real classroom problems or facing the class directly.
(3) To modify the behaviour.
(4) To develop self-confidence.
(5) To train in different roles.
(6) To develop social skills.
(7) To develop spot decision making.

COMMUNICATION

Communication :-

According to Edger Dale, "sharing of ideas and feelings in a mood of mutuality."

According to John Dewey, "It is a process of sharing, experiences, it becomes a common positions.

Nature of communication :-

(1) It is dynamic.
(2) It is behavioural interaction.
(3) It is a complex process.
(4) Communication is a two-way process.
(5) Knowledge of language is required.

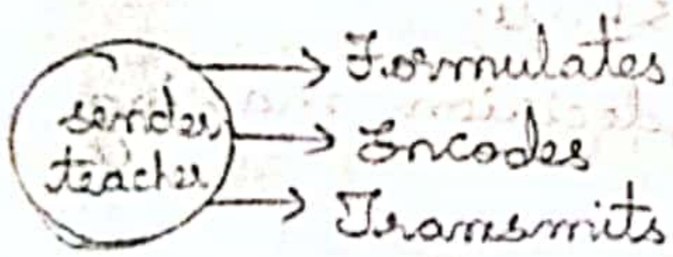
(6) It is omnipresent.
(7) It flows in all directions.
(8) It is a continuous process.
(9) Communication must have substance or proper message.

Elements/ of communication:-
Components

(1) Sender
(2) Receiver
(3) Message
(4) Medium

classroom → Verbal, non-verbal, visual,

→ Communication in the classroom must be cycl



Types of communication
→ Speaking & listening.
→ A good listener is a good communicator.
→ Writing and reading.
→ It is a face-to-face communication.
→ Both receiver and sender involve – writing & read

~~5 forms~~: Observation and Visualisation:-
Formal and informal communication.

Formal:-
It is hierarchy. Official channel is establish
Eg:- If a worker wants to convey any information to the manager, he can do only through the foreman. It has specific format-

Informal

There is no hierarchy. Many individuals can convey information freely. No specific format. Oral sign-ize can communicate symbols also. Daily-ord communication in the form of video- It is from superior to sub-ordinate. Sub-ordinate to superior - upward communication Lateral communication - between different departments