UNIT -1 PEDAGOGICAL ANALYSIS

Paradigm shift from pedagogy to Andragogy to Heutagogy – Concept and stages – Critical Pedagogy: Meaning, Foster independent thinking through critical pedagogy, Need and its implications in Teacher Education. Interaction Analysis: Flanders' Interaction analysis, Galloway's system of interaction analysis (Recording of Classroom Events, Construction and Interpretation of Interaction Matrix).Steps in pedagogical analysis – Five pedagogical approaches – software pedagogy – pedagogical beliefs and attitudes of Computer Science – measuring Computer Science pedagogical content knowledge

Education

According to DURKEIM education is "the action exercised by the adult generations on those who are not yet mature for the social life. Its concern is to
cause and develop a certain number of physical, intellectual and moral states in the child as a whole that require his social environment to which he is especially destined".

MORIN and BRUNET state the meaning of education is the action that consist in helping a human being to train himself, to develop himself, to raise himself: it is also the results of this action". This definition highlights the involvement of both the educator and the educated in the educational process, which is recommended in the active pedagogy. Competences like knowledge, ability and skills that an individual acquires in all circumstances of life- either in family, in school or in society in general come from education. It is at the same time formal, non-formal or informal.

Pedagogy Meaning

Pedagogy comes from the Greek word paidagógia in this word "paidos" means "Child" and "ago" which means "lead"; so the meaning is "to lead the child". In olden days, a pedagogue was the slave in charge of taking roman children to everywhere, but particularly to school. Progressively, pedagogue lose its etymological meaning of accompanying a person and by extension; a pedagogue became synonymous of master, teacher or tutor.

Currently, even if the word pedagogue refer both meanings, i.e. educator and instructor,it refers also to the manner or method of teaching. The education offered by the pedagogue iinclusive. It deals with all aspects namely intellectual, physical, socio-affective, moral, religious, etc

A best pedagogue not because he is a intellectual, or a deep thinker, though he may be so, but because he know especially how to deal with his pupils, how to interest them, motivate them, communicate content, knowledge, skills, etc.,

Finally, we can conclude that pedagogy comprises what teachers do in classroom, but also their ideas, knowledge and attitudes in relation to the learners, the teaching and learning process and the curriculum.

Andragogy Meaning

The word Andragogy derives from the Greek word means "adult-leading". Andragogy means to a theory of adult learning that details some of the ways in which adults learn differently than children. For example, adults be more self-directed, self motivated, and ready to learn. Teachers can draw on concepts of andragogy to increase the effectiveness of their adult education. The andragogy is the combination of Adult Education, Adult Learning and Self Directed Learning. So, andragogy is the art and science of helping adults learn, and a learner focused approach for people of all ages. Learning through SWAYAM is best example for Andragogy.

Assumptions about Andragogy

1. Self Concept: When we get older, our concept of who we are (self-concept) shifts from dependence towards independence and self-direction.
2. Past learning experience : As we grow and experience more life, we accumulate knowledge based on this experience that then becomes a more valuable resource for future learning. By the time we are adults, we have an abundance of experience to draw upon across a variety of contexts.
3. Readiness to learn : Our readiness to learn becomes more oriented to the developmental tasks of our social and work related roles.
4. Practical Reason to learn: As adults, our perspective changes from one of postponed application of knowledge to immediate application, and as such our orientation shifts from one of subject-centered to one of problem-centered.
5. Driven by Internal motivation : As we mature, the motivation to learn is internal

Principles of Andragogy:

Knowles (1984) discussed four principles that educators should consider when teaching adults

1. The learners are involved in the planning for themselves. They plan courses and evaluation pattern for themselves.
2. Mistakes and Positive Experience gives the strong feedback for their learning activities.
3. Learners are very much interested in learning subjects that have real time problems.
4. Learner's learning is problem-centeredand not content-oriented.

On the whole Andragogy emphasis on Self-directed approach in the adults.

Nature of Andragogy

- Mainly Correlated with adult learning.
- It is mainly problem-centered.
- Teaching methods are specific and special for the learners.
- Maximum content is included which is Immediate application in our life.
- The syllabus framed Based on their experience.
- Mainly focused on Personal learning.
- The learners learn according to their self-speed. So, it is self-paced learning.

Pedagogy	Andragogy
Learner is dependent on the teacher.	Learner depending on self.
The teacher is one who evaluate the progress.	The method requires self-evaluation and direction and self-take responsibilities.
Learners comes with little life experience.	Learner uses life experience as a foundation.
Students pass on to the next stage once they have	Learning is triggered by any

completed the necessary steps.	number of life experience and not necessarily led by designated instructor.
Learning is proscribed by the instructed and sequenced in a way that makes logical sense.	Learning is prescribed by self.
Learners are motivated by external sources, such as parents and teachers.	Learners are motivated intrinsic means: self-esteem, quality of life and problem solving.

Heutagogy

Heutagogy (based on the Greek for "self") was defined by Hase and Kenyon in 2000 as the study of self- determined learning.It is the highest level of learning. Heutagogy applies a holistic approach to developing learner capabilities, with learning as an active and proactive process, and learners serving as "the major agent in their own learning, which occurs as a result of personal experiences". As in an andragogical approach, in heutagogy the instructor also facilitates the learning process by providing guidance and resources, but fully give up ownership of the learning path and process to the learner.

Characteristics

Heutagoical approaches an encourage the students to find their own problems and questions to answer. Instead of simply completing the tasks teachers assign,these student seek out of areas of uncertainty and complexity in the subjects they study.

Teachers help by providing context to student's learning and creating opportunities for them to explore subjects fully.

Teacher provides the material but students decide how to negotiate the learning process.

The purpose is to establish an environment where learners can be determine their own goals, learning paths, process and product.

Emphasis is placed on development of learner's capability.

The heutagical approach is a progression from pedagogy to andragogy to heutagogy with learners likewise progressing in maturity and autonomy.

More mature learners require less instruction and course structure and can be more self directed in their learning.

In heutagogy, it is the learner who sets the learning course, designs and develops his own map of learning from curriculum to assessment.

Principles of Heutagogy

- Knowing how to learn is a crucial skill.
- Educators focus on learning process rather than content.
- Learning goes beyond the specific discipline.
- Learning occurs through self-chosen and self- directive action.

Double-Loop Learning

In double learning, learners consider the problems and the resulting actions and
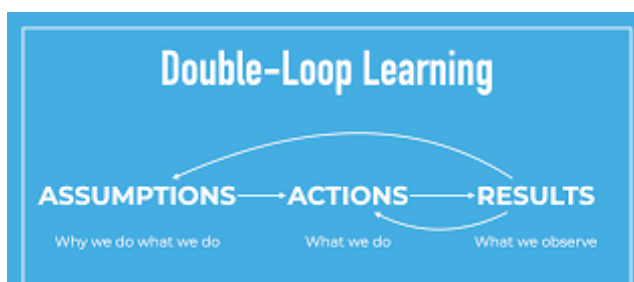
outcomes. In addition to it, there is reflection upon the problem solving process and how it influences learner's own belief and actions. Double loop learning occurs when learners reflect upon and question one's personal values and assumptions as being central to enhancing learning how to learn.

Heutagogy has its principles and practices rooted in andragogy.
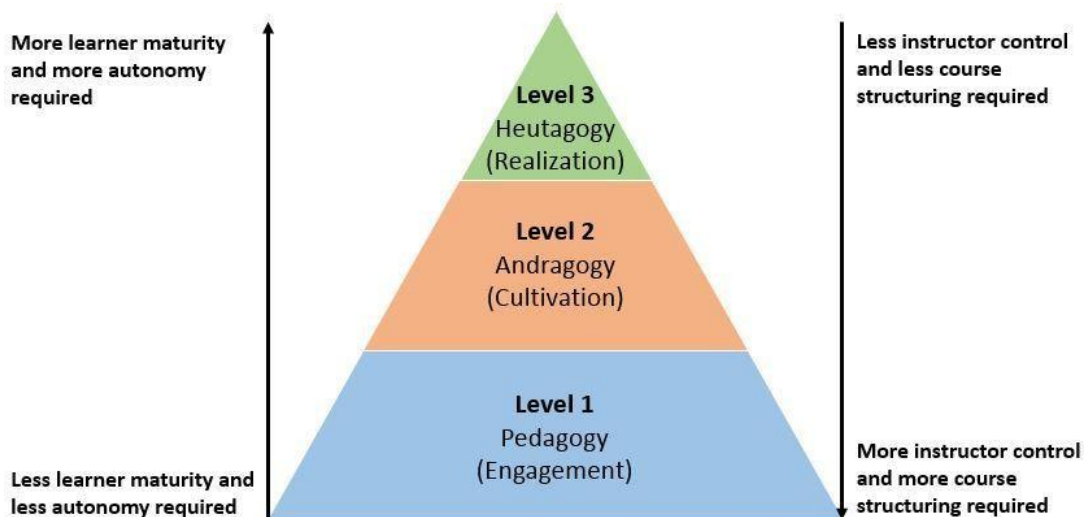
Heutagogy and Andragogy

Heutagogy (Self determined)	Andragogy (Self directed)
Douple loop learning	Single loop Learning
Capability development	Competency Development
Non linear design and Non linear approach	Linear design and Linear approach
Learner directed	Instructor and Learner directed
Getting students to understand how they learn	Getting students to learn

Pedagogy, Andragogy and Heutagogy

Pedagogy	Andragogy	Heutagogy
Instructor Led	Self Regulated and Self Directed	Self Determined
Instructor is the center	Instructor and learners are center	Learners only center
The process is mostly unidirectional	The process is bidirectional	The process is multi directional

Learner contribution is limited.	Learners contribute	Learners contribute and create
Mostly witnessed in school environment.	Mostly witnessed in adult learning.	Mostly witnessed in research environment.
Cognition	Meta-cognition	Epistemic-cognition
Child leading	Man leading	Self leading

Critical Pedagogy

The main aim of teaching is to promote the critical thinking capacity of students and thus, to create good citizens for a just society. Classroom teaching must also a waken the values of justice and equality in student minds. Critical pedagogy is a vital teaching strategay, one designed to strengthen the awreness of learners about social equality, while improving their knowledge. But, now a days teachers prepare the student for scoring high marks in the examination. Due to this reason, teaching is most often test oriented rather than knowledge oriented.

The center of the curriculum used the fundamental goal based on social and political criticises of every day life. The educationist required implementation of range of educational causes with the goal of creating not only a better learning environment. But also a better world. Students should think critically about the educational situation. It must be a recognised connections between the individual problems and which they are embeaded.

Critical pedagogy is an effective method to develop the critical thinking ability of students and to create positive behavioural change in students' lives. According to Freire critical pedagogy defined as a "critical approach to education, highlighting the importance of having learners engage actively in their learning process, and being able to find and develop their own opinion and position".

Kaya and Kaya states that critical pedagogy is a concept that addreseed the problem of education and the education system itself. The purpose of critcal pedagogy is to signal how question of audience voices, power and evaluation can actively work to construct schools into an environment where teachers and students can question the realtionship

between theory and practice, critical analysis and common sense, learning and social change.

Critical pedagogy is a relationship between teaching and learning. It takes shape in the classroom as a dialogue where teacher and students collaborate and investigate everyday topics, academic content, and social issues. Students become active agents of their own learning through guided dialogue carefully crafted into critical and democratic problem-posing frameworks for getting beneath the surface of public and private concerns of conditions for the production of knowledge, values, beliefs, and skills.

Interaction Analysis

Interaction Analysis is a tool used in the classroom to capture quantitative and qualitative aspects of verbal instructor behaviour. It captures the verbal behaviour of teachers and students as an observational device that is directly linked to the social-emotional environment of the classroom.The interaction analysis is using a system of categories to encode and quantifies classroom behaviour of teacher and student. The main purpose of interaction analysis is that a teacher can be trained to use them for analysing classroom behaviour and for studying teachers own teaching activities. Interaction analysis is a process of encoding and decoding the study pattern of teaching and Learning. Coding process means, a code symbol is allocated to each category and a trained observer records by marking down code symbols.Decoding step, a trained analyst explains the display of coded data and reconstruct the original events on the basis of the encoded data even though he may not have been present when the data were collected.The teacher should be familiar with the interaction analysis encoding and decoding process. The

classroom teaching of teacher's trainees is studied through interaction analyses during teaching training programme. The classroom observation sheet should be given to the teacher concerned and the matrix table should be prepared for him to decipher his own behaviour. The process of decoding provides him with own educational and behavioural components.

Characteristics of Interaction Analysis

1. The verbal interaction of the classroom can be made more effective and interesting.
2. Students participation can be increased.

3. The teacher will turn his direct actions into indirect conduct.
4. The innovative behaviour, understanding and exercise of interaction modes can be established.
5. This interaction analysis can be used with microteaching.

Theoretical Assumptions of Interaction Analysis

The various theoretical assumptions, which are basic to idea of interaction analysis, are as follows;

1. In the classroom the verbal communication is predominant.
2. Verbal behaviour of teacher can be observed with higher reliability than most non-verbal behaviour.
3. The verbal statement of a teacher are consistent with his non-verbal gestures.
4. The teacher deploy a great deal of influence on the student.
5. The relation between student and teacher is very important in the teaching learning process.
6. It has been proved that social climate is related to productivity and to the quality of interpersonal relations.
7. The relation between classroom climate and learning is very important.
8. In the classroom teacher's verbal behaviour can be observed objectively using the observation technique.
9. According to feedback the teacher can Change his behaviour.
10. Teacher influence is expressed primarily through verbal statements.

Flander's Interaction Analysis

Ned. A. Flanders developed a system of interaction analysis to study about classroom interaction in a classroom when a teacher teaches. It is known as Flanders Interaction Analysis Categories System (FIACS). Flanders and others developed this system at the University of Minnesota, U.S.A. between 1955 and 1960. Flanders classified total verbal behaviour into 10 categories. Verbal behaviour comprises teacher talk, student talk and silence or confusion.

The ten categories are mentioned as under

1. Teacher Talk – 7 categories

2. Pupil Talk – 2 categories

3. Silence or Confusion- 1 category

Thus, the first seven categories include teacher talk. Next two categories include Students' talk. The last tenth category includes the small spans of silence or pause or confusion. The first 7 categories have been classified into

a) indirect talk

b) direct talk.

Teacher's Talk Indirect Talk

1. Accepts Feelings

2. Praise or Encouragement

3. Accepts or Uses ideas of Pupils

4. Asking Questions

Direct Talk

5. Lecture

6. Giving Directions

7. Criticizing or Justifying Authority

Student Talk

8. Student Talk Response

9. Student Talk Initiation

Neither Teacher Talk nor Pupil Talk

1. Silence or Pause or Confusion

		Category Number	Activity
		1. Accept Feeling	Teacher Accepts feeling of student. Feeling may be positive or negative. Predicting and recalling feelings are included.

Teacher Talk	Indirect Influence	2 Praise or encourage	Teacher praises or encourages students' action or behaviour. Jokes that may release tension, but not at the expense of another individual. The teacher gives positive reinforcement by using the words like "Good", "Very Good", "Excellent".
		3. Accepts or uses ideas of students	It is just like 1st category. But in this category, the students' ideas are accepted only and not his feelings.If a student says on some suggestions, then the teacher may repeat in important point in his own style or words.The teacher develops ideas or suggestions given by a student.
		4. Ask Questions	Asking question about content or procedures, based on the teacher ideas and expecting an answer from the student.
	Direct Influence	5. Lecturing	Giving facts or opinions about content or procedure expression of his own ideas, giving his own explanation or citing an authority other than a pupil.
		6. Giving Direction	The teacher gives directions, commands or orders or initiation, with which a pupil/student is expected to comply with, -Take down the notes -Open your books. - Stand up on the benches.
		7.Criticizes	When the teacher asks the pupils not to interrupt with foolish questions, then this behaviour is included in this category. Teacher's ask "what" and "Why" comes under this category.
Students Talk		8.Students' Response	It includes the student talk in response to teacher's talk. Teacher asks question, student gives answer to the question.
		9.Students' Talk Initiation	Talk by student that they initiate.Expressing own ideas; initiating a new topic; freedom to develop opinions and a line of thought like asking thoughtful questions; going beyond the existing structure.

Silence		10. Silence	Pauses, short periods of silence and period of confusion in which communication cannot be understood by the observer.

Encoding Procedure

1. The observer is to memorize the code Numbers, in relation to key words which are indicated in ten category system.

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

3. At the end of every three seconds he decides which category best represents the communication events just completed. Thus the time involves in coding one tally for every 3 seconds, is 20 tallies in one minute. For example, When teachers accepts students feelings puts 1, When class is silent without any communication puts 10.

4. In this process only the serial numbers of the categories are recorded.

5. When the observation is completed, the observer shifts to some other room and prepares the details on the basis of those serial numbers of the categories.

6. In this observation process, the writing of serial numbers of the categories is called as ENCODING.

7. Writing details of behaviour on the basis of these categories is called as DECODING.

Rules for encoding observation

Flander's category method has many rules for observation, without following which the observation is not possible. The observer must recall these rules. These rules help in maintaining stability and making observations uniform. These rules are as follows:

Rule 1

If more than one type of category occurs during a time interval period, the observer should choose the category that is numerically farther from category 5. Suppose the observer is in doubt whether the category is 1 or 3; he should write 1category.

Rule 2

If more than one category is active in the time interval, and then all the categories should be recorded. If after the first-time interval, no category changes, then the same

serial number should be repeated in the next time interval also.

Rule 3

When teacher calls a child by name, the observer is should be record in 4th category.

Rule 4

When the teacher repeats the student's answer and the answer is a correct, that is recorded as a category No. 2. This tells the student that he has the right answer and therefore functions as praise or encouragement.

Rule 5

When a teacher listens to a pupil and accepts his ideas for a discussion, then this behaviour belongs to category No. 3.

Rule 6

If the teacher's behaviour has been consistently direct or consistently indirect, do not shift into an opposite

classification unless a clear indication of shift is given by the teacher. This rule is often called the rule of the biased, unbiased observer.

Rule 7

If a teacher jokes without aiming at any pupil, this behaviour belongs to the category No. 2. But if he makes any joke aiming at some particular pupil, then it belongs to the category No. 7.

Rule 8

When all the pupils respond to a very small question collectively, then the serial number of category-8 is recorded.

Rule 9

The observer must not concern with his own biases or with the teacher's aim. If the teacher attempts to be clever, student see his statements as criticism of students;

the observer appeal category 7, rather than category 2.

Decoding Process

When encoding the classroom events into ten category system 10 X10 matrix table is prepared for decoding the classroom verbal behaviour. The generalized order of the pupil-teacher interaction can be estimated in this matrix table. We can identify the pair of categories through the table. The first number in the pair indicates the row and the second number shows the column for example (6-3) pair would be shown by a tally in the cell formed by row 6 and column 3. Example for coding is follows: 7,8,9,6,5,1,3,2,4,3,2,4,6,8

Tabulating Matrix

To Tabulate the observations in a 10 X 10 matrix. The convention is to add 10 to the beginning and end of the observation. So, our earlier series now become 10,7,8,9,6,5,1,3,2,4,3,2,4,6,8,10. The data now entered in a 10 X 10 matrix so that the sum of column one equals the sum of row one, the sum of column 2 equals the sum of row 2.etc., If N number of entries marked then N+1 number of pairs will be available.

	1	2	3	4	5	6	7	8	9	10	Total
1			1								1
2				11							2
3		11									2
4			1			1					2
5	1										1
6					1			1			2
7								1			1
8									1	1	2
9						1					1
10							1				1
Total	1	2	2	2	1	2	1	2	1	1	15

The Proportion of Teacher Talk

The Proportion of Teacher Talk can calculated by the given formula.

Proportion of Teacher Talk=(Sum of the numbers in the First Seven rows or Columns/N)X 100

We can calculte from our matrix.

Proportion of Teacher Talk = (11/15) X 100 = 73.33 %

The Proportion of Student Talk

The Proportion of Student Talk can be calculated by the given formula.

Proportion of Student Talk = (sum of the number in the 8th and 9th column or 8th and

9th Row)/N X 100. Proportion of Student Talk = (03/15) X 100 = 20% .

Silence Ratio

The Silence Ratio can be calculated by the given formula.

Silence Ration = (Frequency of the 10th Column or Row/N)X100 =

(1/15)X100=6.66%.

The Ratio Between Indirect and Direct Influence

Indirect and Direct Ratio = (Sum of the Frequencies of the column 1,2,3 and 4 /Sum of the frequencies of the column 5,6 and 7) = 07/04 = 1.75

The ratio is 1 or more than 1 then the teacher is said to be indirect in his behaviour. In the above calculation the teacher have more indirect behaviour.

Ratio between Positive and Negative Reinforement

Ration between positive and negative reinforment can be calculated by the given formula.

Ration between Positive and Negative Reinforcement = (Sum of the frequencies of the column 1,2,3 /Sum of the frequencies 6 and 7) = 05/03 = 1.66

If the ratio is more than one then the teacher is said to be good.

Students Participation Ratio

The students participation ration can be calculated by the given formula.

Students Participation Ratio = (Sum of columns 8 and 9/ Total Sum) = 03/15= 0.2

Students Study State Ratio

	1	2	3	4	5	6	7	8	9	10	Total
1	1,1										

2		2,2									
3			3,3								
4				4,4							
5					5,5						
6						6,6					
7							7,7				
8								8,8			
9									9,9		
10										10,10	
Total											

If the diagonal cells are fully marked it shows that the teacher remains in a particular category for more than three seconds. The cell with the highest frequency of the entire matrix is typically the 5-5 cell which lies on this diagonal indicating that the teacher frequently stays longer than 3 seconds when he provides information through lecture.

Content cross cell

Content Cross Ratio = (Total frequencies in the 4th and 5th rows and columns /N)X100

= (3/15)X100 = 20%

Constructive integration cells and vicious cells

	1	2	3	4	5	6	7	8	9	10	Total
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											

Total										

Constructive Integrative Cells corresponding to 1,2 and 3 are known as constructive integration cells. Vicious cells corresponding to Vicious Cells. These cells reveal the teacher's attention to problems of classroom management and control as distinct from concern with the subject- matter.

Advantages of Flander's Interaction Analysis

1. It is an effective tool to measure the social- emotional climate in the classroom.
2. It is also used for Student teacher feed back.
3. It provides feedback to the Faculty development participant teachers.
4. It is areliable method for observation of classroom teaching.
5. It is much useful in team teaching and microteaching.
6. Different matrices may be created and used to compare teachers' behaviour at various levels of age, gender, subject matter, etc.
7. It is an efficient instrument in the classroom to evaluate the social-emotional environment

Limitations Of Flander's Interaction Analysis

1. It consumes much time in preparing 10 x 10 matrix without which, interpretation is not possible.
2. The observers have to be trained in order to code correctly.
3. Classroom interaction of pupil-pupil type is not considered here.
4. The system of coding and decoding procedure very difficult and expensive.
5. The totality of the classroom activity is not defined by the method. Some acts are still ignored and that is to say that the unrecorded elements of the teaching act are more relevant than those registered.
6. Efforts to characterise teaching are sometimes viewed as measuring the act of teaching and the teacher. Although descriptions can be used as an assessment basis, decision can only be taken after additional value assumptions have been defined and applied to data.

It is expensive and tedious and requires some form of automation to collect and analyse raw information

Galloway's Interaction Analysis

This system of Interaction Analysis was developed by Charles Galloway in the form of a teachers' training technique. It is basically a category type system involving categorization of all sets of possible verbal and non-verbal behaviour of a teacher in the classroom while interacting with the students.

In total there are ten categories of verbal behaviour and ten categories of non-verbal behaviour. These are divided into three major sections:

1. Teacher talk
2. Student Talk
3. Silence and Confusion

In this system connection to the non-verbal signs is given along with the verbal behaviour, as the teachers do pass information to students through non-verbal signs. Theses singns can be either spontaneous and gacilitate any effort to understand others and to be understood. Since, the teacher is the important person in the classroom and his behaviour is one of the most imprtant factor in producing communication and continuous interactions. Thus, this system provides a special approach to a more complete analysis of interction in the classroom as it is combination of both verbal non-verbal dimensions of teacher behaviour.

This method of interaction is named as IDER system.

That means

I- Indirect Verbal Interaction D-Direct Verbal

Interaction

E- Encouraging Non-verbal Interaction R- Restricting Non-

Verbal Interaction

Assumptions in the System

1. 1.Non-verbal communication of a teacher do, has a remarkable part in the classroom interaction.
2. As one cannot see when he behaves, so, a feedback is necessay for the behaviour.
3. The Non-verbal signals are essential and important, as they can reinforce and helpful to motivate the student.

4. Non-verbal communication can be more powerful during interaction in the classroom.

5. If One can aware of non-verbal incidents occurring around, then he can get a better understand of himself.

6. To enhance the aspect of non-verbal communication among teachers, the training will play the vital role.

7. The system is based upon the theory of modification of the teacher's behaviour.

Characteristics of the Galloway's Interaction Analysis

1. If we give correct feedback, teachers can change their verbal or non-verbal behaviour.

2. It helps in describing direct and indirect influence in teaching behaviour.

3. Importance is given on both verbal and non-verbal behaviour.

4. It is analysis of initiative and response of a teacher.

5. It is very much used in research in teaching.

Category wise verbal and Non-verbal Behaviour Recording of Classroom Events

The observer choose an correct position in class to listen and watch smoothly. He must to be trained, must memorize the code number and letter. The observer marks the slash / (for encouraging) and dash (Restricting) to the right of recorded tallies for e.g.during lecturing when non- verbal behaviour also appear the observer writes s/ if non verbal behaviour does not appear "S-". A critical number is used to denote purely non-verbal behaviour e.g(S). Then note down code within every 3 seconds. For example a teacher is praising observer marks as 2 when lecturing writes S. Mark 20 observations per Minute.

Construction of Interaction Matrix Decoding Process

Verbal and non verbal behaviour of the systems for the 20 X20 matrix table is used. According to Dr.R.A.Sharma "There are 400 cells in this Table. Each section displays the order flow of the two actions. Two classes, the two volumes are consider the teacher to evaluate the behaviour of the flow.

It also explains how the matrix is followed by action. This table displays the aural

section of sustainbility practices. This table is prepared on the basis of inspection class system. The verbal and nonverbal sections separated pairs are depicted in the table of frequency.

The frequencies listed in the table above procedure IDER table is crafted pieces. The IDER table is classified into four parts and components of the pratice is to calculate the percentage.

If you need a qualitative analysis 'flow-chart' is made on the basis of the qualitative analysis is the study of teacher practices.

To interpret data provided by the IDER matrix, it is necessary to know that numbers from 1 through 10

represent Flanders verbal categories whenthese are accompanie by encouraging nonverbal cues. Numbers from 11through 20 represent the same categories accompanied by restricting nonverbal expressions. Quadrant one of the matrix provides data regarding verbal behaviours consistently accompanied by encouraging nonverbal cues. Quadrant three of the matrix supplies data regarding verbal behaviours consistently accompanied by restricting nonverbal expressions, and Quadrants two and four provide insight into patterns of behavioural transition.

Advantages

1. Modification of behaviour can be done through continuous feed back.
2. Give opportunity to a teacher to improve upon its Non-verbal behaviour.
3. It is reliable technique of observing and analysing the verbal and non-verbal behaviour of a teacher in class.
4. It analysises the pattern of teacher.
5. It is very much useful in research. i.e., to study about usefulness in pre-service and in-service training.

Limitations

1. Teacher may feel shy to express concept when a supervisor absorbs him.
2. It is very diffcult to observe at the same time verbal and Non-verbal behaviour.
3. It could not be properly categorised.
4. It take more time. So it is time consuming.
5. It does not describe the total classroom behaviour.

6. Student – Student interaction is not mentioned.

The value judgement is not included. Example Good behaviour and Bad Behaviour

Gallow

		Category Number	Activity		
			Verbal Communication and it's Code and its Representation Code	Desirable Non-Verbal and it's Code	UndesirableNon- Verbal and it's Code
Negative Teacher Talk	Indirect Influence	1	Accept Feeling	Teacher Accepts feeling of student. (1)	Corresponding Smile, Nodding the heads, eye contact and appropriate gesture. (Q)	Corresponding Smile, Nodding the heads, eye contact and appropriate gesture. (A)
		2	Praise or encourage	Teacher praises or encourages students' action or behaviour. (2)	The teacher gives positive reinforcement by using the gestures. (W)	The teacher gives negative reinforcement by using the gesture. (S)

		3	uses ideas of students	Teacher uses student's idea to build the ideas of clarifying. (3)	When in appropriate manner it is said to be implementing. (E)	When in not in correct manner it is mentioned as not possible symbolically. (T)
		4	Ask Questions	Asking question to the student. (4)	When the teacher shows the proper eye contact to the students of proper tone to the particular student. (R)	When the teacher shows the proper eye contact to the students of proper tone to control particular student. (F)
	Direct Influence	5	Lecturing	Giving facts or opinions about content or procedure expression of his	When teacher shows appropriate gesture and body language to the content of the	When teacher shows appropriate gesture and body language to the

				own ideas.(5)	response towards students behaviour. It is said to responsive. (T)	content of the response towards students behaviour. It is said to unresponsive. (G)
		6	Giving Direction	The teacher gives directions, commands or orders or initiation. (6)	When a teacher involves students, wish and appropriate gesture like, yes, smiling.(Y)	When a teacher involves does not obey or wish and appropriate gesture nodding the head as no, like that. (H)
		7	Criticizes	When the teacher asks the pupils not to interrupt with foolish questions, then this behaviour is included in this category. (7)	When the teacher is said to be from when he receives students' response and proper eye contact.(U)	But he does not accept or stair and in appropriate facial expression it is termed as harsh. (J)
Student		8	Students, Response	It includes the student talk in response to teacher's talk. Teacher asks question, student gives answer to	The corresponding behaviour for category 8 was not taken into	The corresponding behaviour for category 8 was not taken into

s Talk				the question. (8)	consideration. (-)	consideration. (-)
		9	Initiation	Talk by student that they initiate. Expressing own ideas; initiating a new topic; freedom to develop opinions	Non-verbal does not taken into consideration. (-)	Non-verbal does not taken into consideration. (-)
				and a line of thought like asking thoughtful questions; going beyond the existing structure. (9)		
Silence or confusion		10	**Silence or confusion**	**Pauses, short periods of silence and period of confusion in which communication cannot be understood by the observer. (0)**	Not taken into consideration. (ZERO)	**Not taken into consideration. (ZERO)**

PEDAGOGICAL ANALYSIS

Introduction: The concept of pedagogy is not a new concept in the field of education. It was most popular before 1960 and also it was a course of study in education. After 1960, the term educational technology had replaced the term pedagogy. In between 1960 to 1980, the term educational technology was most popular all over the world in the discipline of education. After 1980, the term pedagogy has emerged as a new innovation in education. Both of these concepts -: educational technology and pedagogy are interrelated. The pedagogy helps in understanding the meaning of educational technology. Hence, educational technology is nothing without pedagogy. Pedagogical analysis is utmost important for a language teacher to make his/her teaching effective to achieve the aims and objectives of curriculum of a particular class.

Meaning of Pedagogical Analysis: Generally, the term pedagogy means is the art as well as science of teaching method. The science deals with effectiveness of teaching and art relates to artistry. Similarly the knowledge of teaching is achieved by practice and experience in classroom. The term pedagogical analysis is the combination of two words-: "Pedagogical" and "Analysis". It is the scientific and analytical study of teaching a topic. The sole objective of pedagogical analysis is to make teaching learning process more scientific, effective, and impressive. The term pedagogical analysis has been explained with the help of the following chart.
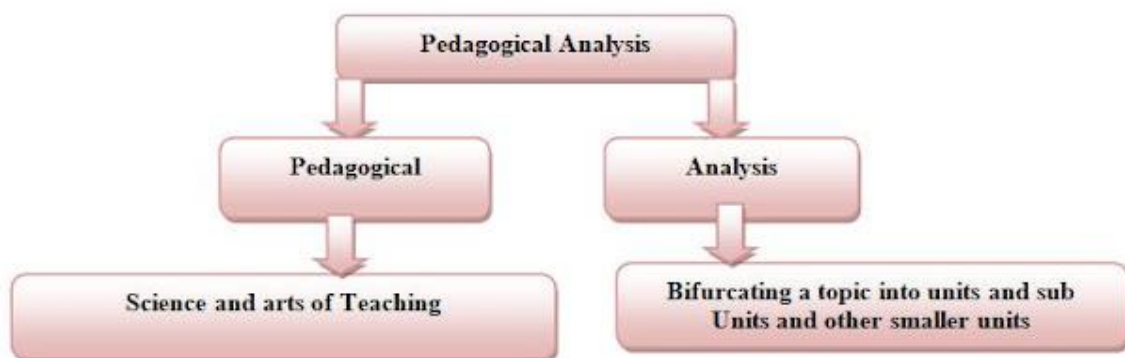
Teaching is a complex phenomenon as its nature is artistic and scientific. The most we considered teaching as an art, loaded with emotions, feelings, values, beliefs, and excitement, the most difficult is to drive rules, principles, or generalization. When we considered teaching as a science or at least partly science, then pedagogy is predictable to that extent, it can be

observed and measured with some accuracy and research can be applied to the practice of teaching.

Components of pedagogical Analysis: Pedagogical analysis is based on four essential pillars along with their mutual relationships and interdependence for being considered essential in the effective teaching learning process. The components of pedagogical analysis are given below with the help of the following chart.
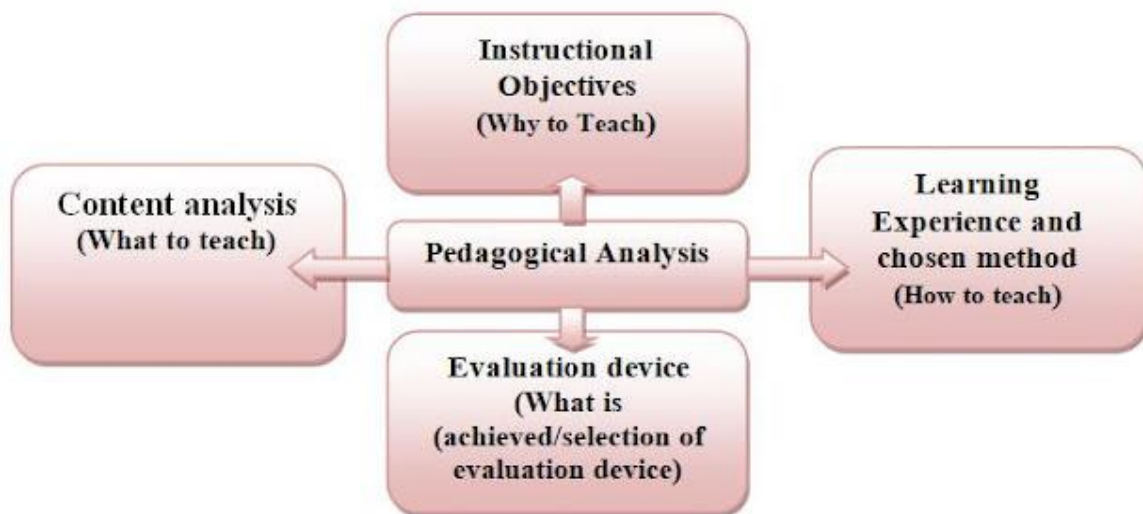
Four fold activities of Pedagogical Analysis: To make teaching learning process more effective, systematic, scientific and impressive we have to carry out these different activities of pedagogical analysis. Hence it is better to discuss and understand the following constituent parts of pedagogical analysis.

(I)   Unit Analysis/Content Analysis.

(II)   Formulation of instructional objectives.

(III)   Learning experience and chosen method.

(IV)   Evaluation method.

(I) Unit Analysis/ Content Analysis: Unit means topic and analysis means dividing it into parts. The content analysis is not an easy task. In doing content analysis a teacher should have sound knowledge of teaching techniques teaching maxims and the nature of the subject matter. Before teaching, a teacher has to divide the topic into smaller parts/units. During the time of dividing unit into smaller and simpler sub-units the teacher has to identify and write down teaching points. Teaching points is the smallest important unit of teaching from the subject matter that is to be presented before the students. At the time of selecting teaching points, a teacher has to be vigilant, careful, skillful, intelligent and systematic in approach.

(II) Formulation of objectives: Pedagogical Analysis is the systematic and scientific analysis of the teaching and the content. Formulation of the objectives is the second step in pedagogical analysis. After carried out the first step of pedagogical analysis that is unit analysis, a teacher has to formulate the instructional objectives in behavioural terms because the instructional objectives are the learning outcomes. It is the end products of teaching learning process. Learning is change in behaviour. This change in behaviour may be any of the domains -: Cognitive, Affective, or Psychomotor. A successful teaching is based on a successful realization of formulated instructional objectives. Before formulating instructional objectives a teacher needs to study thoroughly the different approaches of behavioural objectives i.e. Bloom's Taxonomy of teaching learning objectives, Robert Mager's approach, Robert Millar's approach and RCEM approach. The teacher is required to have a good knowledge of the psychological and educational principles of teaching learning process.

(III) Learning Experiences and chosen method: Learning experiences and chosen method is the third step in pedagogical analysis. After conforming about what to teach (subject matter) and why to teach (instructional objectives) then the teacher has to choose the best methods, maxims, techniques, tactics, strategies, approaches to teach the particular subject matter. The teacher should have the clear knowledge about the teaching skills and the knowledge of using audio visual aids effectively. An English teacher has to select suitable methods i.e. Direct Method, Bilingual Method, Translation Method and the best approach for properly learning outcomes.

(IV)Evaluation Device: This is the last and foremost step of pedagogical analysis. It is very well known that evaluation is desired changes in the behaviour of the students. The total behavioural outcomes are measured with the help of the evaluation devices. Right evaluation is the tedious job. It requires lot of skills and knowledge on the part of the teacher. After having

taught the lesson, the teacher attempts to know how is his teaching was. Evaluation at the end of the lesson includes two aspects-: (i) Recapitulation and (ii) Home work. After the end of the lesson the teacher carries out recapitulation. He asks certain questions on the basis of the lesson he has just taught. Question may be asked from the whole class and the individual students. The questions are generally objective and open ended. After making recapitulation questions to the students, then the teacher has to give the home work to the students. The home work given to the students should not be over loaded and that should be related to the class work. It should be checked out immediately; otherwise the students are not motivated to do any homework further.

5 Pedagogical Approaches in Teaching

Teachers primary concern are the learners. They have to teach in order for their students to learn something. They use some tools in teaching such as books, visuals, and any other suitable materials. However, teaching is not as easy as that because they also have to be aware of the 5 Pedagogical Approaches which can enhance the process of learning.

The Five 5 Pedagogical Approaches in Teaching are:

1. Contructivism or the Constructivist Approach

2. Collaborative Approach

3. Inquiry-Based Approach

4. Integrative Approach

5. Reflective Approach

Constructivism or Constructivist Approach

Constructivist teaching is based on constructivist learning theory. It based on the belief that learning occurs as learners are actively involved in a process of meaning and knowledge construction as opposed to passively receiving information. Learners are the makers of meaning and knowledge.

Collaborative Approach

Collaborative learning is a situation in which two or more people learn or attempt to learn something together. Unlike individual learning, people engaged in collaborative learning capitalize on one another's resources and skills (asking one another for information, evaluating one another's ideas, monitoring one another's work, etc.).More specifically, collaborative learning is based on the model that knowledge can be created within a population where members actively interact by sharing experiences and take on asymmetry roles.

Inquiry-Based Approach

Inquiry-based learning (also enquiry-based learning in British English) is a form of active learning that starts by posing questions, problems or scenarios—rather than simply presenting established facts or portraying a smooth path to knowledge. The process is often assisted by a facilitator. Inquirers will identify and research issues and questions to develop their knowledge or solutions. Inquiry-based learning includes problem-based learning, and is generally used in small scale investigations and projects, as well as research. The inquiry-based instruction is principally very closely related to the development and practice of thinking skills.

Integrative Approach

Integrative learning is a learning theory describing a movement toward integrated lessons helping students make connections across curricula. This higher education concept is distinct from the elementary and high school "integrated curriculum" movement. Integrated studies involve bringing together traditionally separate subjects so that students can grasp a more authentic understanding. Interdisciplinary curricula has been shown by several studies to support students' engagement and learning. Specifically integrating science with reading comprehension and writing lessons has been shown to improve students' understanding in both science and English language arts.

Reflective Approach

Reflective teaching is a process where teachers think over their teaching practices, analyzing how something was taught and how the practice might be improved or changed for better learning outcomes. Some points of consideration in the reflection process might be what is currently being done, why it's being done and how well students are learning. You can use reflection as a way to simply learn more about your own practice, improve a certain practice (small groups and cooperative learning, for example) or to focus on a problem students are having.

Digital pedagogy

Digital pedagogy is the study and use of contemporary digital technologies in teaching and learning. Digital pedagogy may be applied to online, hybrid, and face-to-face learning environments.

. It is an expectation grounded in students' personal and recreational pursuits. The non-schooling part Educators face the constant challenge of refining teaching and learning techniques to keep up with the increasing demands and expectations of students, whom we describe as digitally expectant. Students expect that the teaching and learning they will experience across their years of formal schooling will be rich in digital technologiesof their lives is rich in digital technologies: they watch digital TV; listen to digital radio; use smartphones; are fluent in Web 2.0, social networking, digital images, iPad, electronic text … the list is endless. As new technologies enter the market they are enthusiastically taken up. The characteristics and behaviours of these students are distinctly different from those of their teachers. Teachers in the majority resemble Prensky's (2001) digital immigrants—they range along a continuum of those who have attempted to use information and communication technology (ICT) to those who have not embraced the use of ICT in the instructional process. Most teachers tend to be self-taught or peer-taught. Their technology skills tend to be limited to what is in their home and work environment. Most teachers are using technology every day, but the types of technology they use might not be as up to date as their students, nor even their teaching requirements, need them to be. Technological skills are not the defining factor for an effective digital pedagogy. This chapter does not argue that we all need to become expert programmers or web page builders. Digital pedagogy is more about an attitude towards and aptitude with digital technologies. It is more about a willingness to use them in the classroom effectively and to understand how and why they should be used.

It is not only the expectations of students that need to be considered. Increasingly, parents, employers and the wider community expect the education system to produce technologically fluent students—students who can use a wide variety of digital technologies, and who have the behaviours and knowledge that will enable them to use emerging technologies. Let's have a closer look at these expectations. Parents are aware of the increasingly digital world within which their children live. It would be normal for parents to assume that the teaching and learning their children engage in includes digital technologies. Schools are increasingly asked to bridge the gap between what the parents can afford to have in their homes for their children

to use, and the types of technologies they would like their children to experience or be fluent in. Employers are digitally expectant of employees. Whether employees are secondary students in parttime jobs or students exiting from the education system, employers expect them to be able to use digital technologies. These expectations include fluency in basic programs commonly used, but some expectations might be subject-specific depending upon the types of subjects the students studied and the field they are entering. Finally, there are the expectations from the wider community.

It would be a commonly held belief that schools are using a wide variety of digital technologies in their teaching and learning. The media often report on schools that are doing a particular project using digital technologies, people see students using digital tools and there are government initiatives such as the laptop program that create in the minds of the wider community a sense that schooling is increasingly digital.

Introduction to Software Pedagogy

Definition: Software pedagogy refers to the methods and practices used in teaching computer science and software development.

Importance: Understanding software pedagogy helps educators effectively teach complex computer science concepts.

2. **Pedagogical Beliefs in Computer Science**

Constructivism: Belief that students learn best through hands-on, experiential learning. Emphasis on problem-solving and project-based learning.

Behaviorism: Focus on structured learning and reinforcement. Use of drills and practice exercises to build foundational skills.

Cognitivism: Emphasis on mental processes and understanding. Encourages teaching strategies that enhance critical thinking and problem-solving.

Social Constructivism: Learning as a social process. Importance of collaboration, peer learning, and discussion.

3. **Attitudes towards Teaching Computer Science**

Positive Attitudes: Enthusiasm for the subject, belief in the value of computer science education, and commitment to student success.

Challenges: Overcoming stereotypes about computer science being difficult, addressing diverse learning needs, and staying updated with technological advancements.

4. Teaching Methods in Computer Science

Lecture-Based Learning: Traditional approach, useful for introducing new concepts and theories.

Active Learning: Techniques such as pair programming, group projects, and in-class exercises to engage students.

Flipped Classroom: Students review content at home and engage in hands-on activities in class.

Inquiry-Based Learning: Encourages students to ask questions, explore, and discover solutions independently.

Measuring Computer Science Pedagogical Content Knowledge (PCK)

1. Definition of PCK

Content Knowledge: Understanding of computer science concepts and principles.

Pedagogical Knowledge: Knowledge of teaching methods and strategies.

Pedagogical Content Knowledge: Integration of content and pedagogy to effectively teach computer science.

2. Components of PCK in Computer Science

Knowledge of Curriculum: Familiarity with computer science curriculum and standards.

Knowledge of Students: Understanding students' prior knowledge, misconceptions, and learning needs.

Knowledge of Instructional Strategies: Use of appropriate teaching methods for different topics.

Knowledge of Assessment: Designing and implementing assessments to measure student understanding.

3. Assessing PCK in Computer Science

Self-Assessment: Reflective practices where teachers evaluate their own teaching methods and content knowledge.

Peer Assessment: Feedback from colleagues on teaching practices.

Student Feedback: Surveys and feedback from students on the effectiveness of teaching methods.

Performance Assessments: Evaluating student projects, assignments, and exams to gauge teaching effectiveness.